Z - 8 0   E S F   F O R T H   V E R   1 . 0

THIS IMPLEMENTATION OF FORTH REPESENTS A TRANSLATION OF THE FORTH INTEREST GROUP 8080 VERSION. AS MUCH AS POSSIBLE, FIG-FORTH COMPATABILITY HAS BEEN MAINTAINED

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MORE INFORMATION REGARDING FIG-FORTH AND THE FORTH INTEREST GROUP MAY BE OBTAINED BY WRITING:

FORTH INTEREST GROUP

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THIS IMPLEMENTION WAS ACCOMPLISHED USING MICROSOFT'S EDITOR ASSEMBLER+. MACROS WERE UTILIZED WHERE MULTIPLE WORD DEFINITIONS WERE DESIRED ON A SINGLE LINE.

```
00010 DW       MACRO    #W1
00020          DEFW     #W1
00030          ENDM
00040 DW2      MACRO    #W1,#W2
00050          DEFW     #W1
00060          DEFW     #W2
00070          ENDM
00080 DW3      MACRO    #W1,#W2,#W3
00090          DEFW     #W1
00100          DEFW     #W2
00110          DEFW     #W3
00120          ENDM
00130 DW4      MACRO    #W1,#W2,#W3,#W4
00140          DEFW     #W1
00150          DEFW     #W2
00160          DEFW     #W3
00170          DEFW     #W4
00180          ENDM
00190 DW5      MACRO    #W1,#W2,#W3,#W4,#W5
00200          DEFW     #W1
00210          DEFW     #W2
00220          DEFW     #W3
00230          DEFW     #W4
00240          DEFW     #W5
00250          ENDM
00260 DW6      MACRO    #W1,#W2,#W3,#W4,#W5,#W6
00270          DEFW     #W1
00280          DEFW     #W2
00290          DEFW     #W3
00300          DEFW     #W4
00310          DEFW     #W5
00320          DEFW     #W6
00330          ENDM
00340 DW7      MACRO    #W1,#W2,#W3,#W4,#W5,#W6,#W7
00350          DEFW     #W1
00360          DEFW     #W2
00370          DEFW     #W3
00380          DEFW     #W4
00390          DEFW     #W5
00400          DEFW     #W6
00410          DEFW     #W7
00420          ENDM
00430 DW8      MACRO    #W1,#W2,#W3,#W4,#W5,#W6,#W7,#W8
00440          DEFW     #W1
00450          DEFW     #W2
00460          DEFW     #W3
00470          DEFW     #W4
00480          DEFW     #W5
00490          DEFW     #W6
00500          DEFW     #W7
00510          DEFW     #W8
00520          ENDM
00530 DB       MACRO    #B1
00540          DEFB     #B1
00550          ENDM
```

```
                   00560 MB        MACRO     #B1
                   00570          DEFB      '#B1'+80H
                   00580          ENDM
                   00590 DM        MACRO     #B1
                   00600          DEFM      '#B1'
                   00610          ENDM
                   00620 HD        MACRO     #B1,#B2,#B3,#W1
                   00630          DEFB      #B1+80H
                   00640          DEFM      '#B2'
                   00650          DEFB      '#B3'+80H
                   00660          DEFW      #W1
                   00670          ENDM
                   00680 *MLIST    ON
0001               00690 RELEAS    EQU       1
0000               00700 REVISI    EQU       0
0000               00710 USRVER    EQU       0
                   00720 ;
                   00730 ; ASCII CHARS TO BE USED
                   00740 ;
0020               00750 ABL       EQU       20H
000D               00760 ACR       EQU       0DH
002E               00770 ADOT      EQU       2EH
0007               00780 BELL      EQU       07H
0008               00790 BSIN      EQU       08H
0008               00800 BSOUT     EQU       08H
0010               00810 DLE       EQU       10H
000A               00820 LF        EQU       0AH
000C               00830 FF        EQU       0CH
                   00840 ;
                   00850 ; MEMORY ALLOCATION
                   00860 ;
7FF0               00870 EM        EQU       07FF0H            ; TOP OF MEM + 1 = LIMIT
0003               00880 NSCR      EQU       3
0400               00890 KBBUF     EQU       1024              ; BYTES/DISK BUFFER
0040               00900 US        EQU       40H
00A0               00910 RTS       EQU       0A0H
0404               00920 C0        EQU       KBBUF+4
0003               00930 NBUF      EQU       NSCR*400H/KBBUF
73E4               00940 BUF1      EQU       EM-C0*NBUF
0001               00950 BSCRE     EQU       400H/KBBUF
73A4               00960 INITR0    EQU       BUF1-US
7304               00970 INITS0    EQU       INITR0-RTS
                   00980 ;
                   00990 ;
                   01000 ;
4350               01010          ORG       4350H
4350 00            01020 ORIG      NOP
4351 C3A552        01030          JP        CLD
4354 00            01040          NOP
4355 C38B52        01050          JP        WRM
4358               01060          DB        RELEAS
4358 01                           DEFB      RELEAS
                                  ENDM
4359               01070          DB        REVISI
4359 00                           DEFB      REVISI
                                  ENDM
435A               01080          DB        USRVER
435A 00                           DEFB      USRVER
```

```
                            ENDM
435B            01090       DB        0EH
435B 0E                     DEFB      0EH
                            ENDM
435C            01100       DW        TASK-7
435C 535B                   DEFW      TASK-7
                            ENDM
435E            01110       DW        BSIN
435E 0800                   DEFW      BSIN
                            ENDM
4360            01120       DW        INITR0
4360 A473                   DEFW      INITR0
                            ENDM
                01130 ;
                01140 ; FOLLOWING USED BY "COLD"
                01150 ; MUST BE IN SAME ORDER AS USER VARIABLES
                01160 ;
4362            01170       DW8       INITS0,INITR0,INITS0,1FH,0,INITDP.INITDP.FOR
TH+6
4362 0473                   DEFW      INITS0
4364 A473                   DEFW      INITR0
4366 0473                   DEFW      INITS0
4368 1F00                   DEFW      1FH
436A 0000                   DEFW      0
436C 5E5B                   DEFW      INITDP
436E 5E5B                   DEFW      INITDP
4370 0952                   DEFW      FORTH+6
                            ENDM
                01180 ;
                01190 ; END OF DATA USED BY "COLD"
                01200 ;
4372            01210       DW2       0,0B250H
4372 0000                   DEFW      0
4374 50B2                   DEFW      0B250H
                            ENDM
                01220 ;
                01230 ; ================================================
                01240 ;
                01250 ;        FORTH REGISTERS
                01260 ;
                01270 ;        FORTH    Z-80     FORTH PRESERVATION RULES
                01280 ;        -----    ----     ------------------------
                01290 ;        IP       BC       SHOULD BE PRESERVED ACROSS FORTH
                01300 ;                          WORDS
                01310 ;        W        DE       SOMETIMES OUTPUT FROM NEXT
                01320 ;                          MAY BE ALTERED BEFORE JMPING TO NEXT

                01330 ;                          INPUT ONLY WHEN DPUSH CALLED
                01340 ;        SP       SP       SHOULD BE USED ONLY AS DATA STACK
                01350 ;                          ACROSS FORTH WORDS
                01360 ;                          MAY BE USED WITHIN FORTH WORDS
                01370 ;                             IF RESTORED BEFORE NEXT
                01380 ;                 HL       NEVER OUTPUT FROM NEXT
                01390 ;                          INPUT ONLY WHEN HPUSH CALLED
                01400 ;
4376            01410 UP    DW        INITR0
4376 A473                   DEFW      INITR0
                            ENDM
```

```
4378              01420 RPP      DW       INITR0
4378 A473                        DEFW     INITR0
                                 ENDM
                  01430 ;
                  01440 ; ===========================================================
                  01450 ;
                  01460 ;        COMMENT CONVENTIONS
                  01470 ;
                  01480 ;        NAME      =         ADDRESS OF NAME
                  01490 ;        (NAME)    =         CONTENTS AT NAME
                  01500 ;        ((NAME))=           INDIRECT CONTENTS
                  01510 ;
                  01520 ;        CFA       =         ADDRESS OF CODE FIELD
                  01530 ;        LFA       =         ADDRESS OF LINK FIELD
                  01540 ;        NFA       =         ADDR OF START OF NAME FIELD
                  01550 ;        PFA       =         ADDR OF START OF PARAMETER FIELD
                  01560 ;
                  01570 ;        S1        =         ADDR OF 1ST WORD ON PARAMETER STACK
                  01580 ;        S2        =                 2ND
                  01590 ;        R1        =         ADDR OF 1ST WORD OF RETURN STACK
                  01600 ;        R2        =                 2ND
                  01610 ;
                  01620 ;        LB        =         LOW BYTE
                  01630 ;        HB        =         HIGH BYTE
                  01640 ;        LW        =         LOW WORD
                  01650 ;        HW        =         HIGH WORD
                  01660 ;
                  01670 ; ===========================================================
                  01680 ;
                  01690 ;           THE FORTH ADDRESS INTERPRETER
                  01700 ;
                  01710 ;        T H E    V I R T U A L    M A C H I N E
                  01720 ;
                  01730 ;           (POST INCREMENTING VERSION)
                  01740 ;
437A D5           01750 DPUSH    PUSH     DE
437B E5           01760 HPUSH    PUSH     HL
437C 0A           01770 NEXT     LD       A,(BC)           ; (W) <- ((IP))
437D 03           01780          INC      BC               ; (IP) <- (IP)+2
437E 6F           01790          LD       L,A
437F 0A           01800          LD       A,(BC)
4380 03           01810          INC      BC
4381 67           01820          LD       H,A              ; (HL) <- CFA
4382 5E           01830 NEXT1    LD       E,(HL)           ; (PC) <- ((W))
4383 23           01840          INC      HL
4384 56           01850          LD       D,(HL)
4385 EB           01860          EX       DE,HL
4386 E9           01870          JP       (HL)             ; NOTE: (DE) = CFA+1
                  01880 ;
                  01890 ; ===========================================================
                  01900 ;
                  01910 ;        FORTH DICTIONARY FORMAT
                  01920 ;
                  01930 ;        ADDRESS NAME              BYTE CONTENTS
                  01940 ;        ------- ----              ---- --------
                  01950 ;        NFA     NAME FIELD        1PS<LEN> P=PREC.S=SMUDGE
                  01960 ;                                  0CHARN
                  01970 ;                                     ...
```

```
                01980 ;       LFA     LINK FIELD      LB PREV. WORDS NFA
                01990 ;                               HB
                02000 ;LABEL CFA     CODE FIELD      LB ADDR CPU CODE
                02010 ;                               HB
                02020 ;       PFA     PARAMETER       1ST PARAMETER BYTE
                02030 ;               FIELD
                02040 ; ===========================================================
                02050 ;
4387            02060 DP0     HD      3,LI,T,0
4387 83                         DEFB    3+80H
4388 4C                         DEFM    'LI'
4389 49
438A D4                         DEFB    'T'+80H
438B 0000                       DEFW    0
                                ENDM
438D            02070 LIT     DW      $+2       ; S1 <- ((IP))
438D 8F43                       DEFW    $+2
                                ENDM
438F 0A         02080           LD      A,(BC)  ; (HL) <- ((IP)) = LITERAL
4390 03         02090           INC     BC       ; (IP) = (IP)+2
4391 6F         02100           LD      L,A      ; L = LB
4392 0A         02110           LD      A,(BC)
4393 03         02120           INC     BC
4394 67         02130           LD      H,A      ; H = HB
4395 18E4       02140           JR      HPUSH    ; (S1) <- (HL)
                02150 ;
4397            02160           HD      7,EXECUT,E,LIT-6
4397 87                         DEFB    7+80H
4398 45                         DEFM    'EXECUT'
4399 58
439A 45
439B 43
439C 55
439D 54
439E C5                         DEFB    'E'+80H
439F 8743                       DEFW    LIT-6
                                ENDM
43A1            02170 EXEC    DW      $+2
43A1 A343                       DEFW    $+2
                                ENDM
43A3 E1         02180           POP     HL
43A4 18DC       02190           JR      NEXT1
                02200 ;
43A6            02210           HD      6,BRANC,H,EXEC-0AH
43A6 86                         DEFB    6+80H
43A7 42                         DEFM    'BRANC'
43A8 52
43A9 41
43AA 4E
43AB 43
43AC C8                         DEFB    'H'+80H
43AD 9743                       DEFW    EXEC-0AH
                                ENDM
43AF            02220 BRAN    DW      $+2       ; (IP) <- (IP) + ((IP))
43AF B143                       DEFW    $+2
                                ENDM
43B1 60         02230 BRAN1   LD      H,B      ; (HL) <- (IP)
43B2 69         02240           LD      L,C
```

```
43B3 5E          02250              LD    E,(HL)  ; (DE) <- ((IP)) = BRANCH OFFSET
43B4 23          02260              INC   HL
43B5 56          02270              LD    D,(HL)
43B6 2B          02280              DEC   HL
43B7 19          02290              ADD   HL,DE   ; (HL) <- (HL) + ((IP))
43B8 4D          02300              LD    C,L     ; (IP) <- (HL)
43B9 44          02310              LD    B,H
43BA 18C0        02320              JR    NEXT
                 02330 ;
43BC             02340              HD    7,0BRANC,H,BRAN-9
43BC 87                             DEFB  7+80H
43BD 30                             DEFM  '0BRANC'
43BE 42
43BF 52
43C0 41
43C1 4E
43C2 43
43C3 C8                             DEFB  'H'+80H
43C4 A643                           DEFW  BRAN-9
                                    ENDM
43C6             02350 ZBRAN        DW    $+2
43C6 C843                           DEFW  $+2
                                    ENDM
43C8 E1          02360       .      POP   HL
43C9 7D          02370              LD    A,L
43CA B4          02380              OR    H
43CB 28E4        02390              JR    Z,BRAN1 ; IF (S1)=0 THEN BRANCH
43CD 03          02400              INC   BC      ; ELSE SKIP OFFSET
43CE 03          02410              INC   BC
43CF 18AB        02420              JR    NEXT
                 02430 ;
43D1             02440              HD    6,(LOOP,),ZBRAN-0AH
43D1 86                             DEFB  6+80H
43D2 28                             DEFM  '(LOOP'
43D3 4C
43D4 4F
43D5 4F
43D6 50
43D7 A9                             DEFB  ')'+80H
43D8 BC43                           DEFW  ZBRAN-0AH
                                    ENDM
43DA             02450 XLOOP        DW    $+2
43DA DC43                           DEFW  $+2
                                    ENDM
43DC 110100      02460              LD    DE,1               ; (DE) <- INCREMENT
43DF 2A7843      02470 XLO01        LD    HL,(RPP)           ; ((HL)) = INDEX
43E2 7E          02480              LD    A,(HL)
43E3 83          02490              ADD   A,E
43E4 77          02500              LD    (HL),A
43E5 5F          02510              LD    E,A
43E6 23          02520              INC   HL
43E7 7E          02530              LD    A,(HL)
43E8 8A          02540              ADC   A,D
43E9 77          02550              LD    (HL),A
43EA 23          02560              INC   HL                 ; ((HL)) = LIMIT
43EB 14          02570              INC   D
43EC 15          02580              DEC   D
43ED 57          02590              LD    D,A                ; (DE) <- NEW INDEX
```

```
43EE  FAF843    02600         JP      M,XLOO2        ; IF INCR > 0
43F1  7B        02610         LD      A,E
43F2  96        02620         SUB     (HL)           ; THEN (A) <- INDEX - LIMIT
43F3  7A        02630         LD      A,D
43F4  23        02640         INC     HL
43F5  9E        02650         SBC     A,(HL)
43F6  1805      02660         JR      XLOO3
43F8  7E        02670 XLOO2   LD      A,(HL)         ; ELSE (A) <- LIMIT - INDEX
43F9  93        02680         SUB     E
43FA  23        02690         INC     HL
43FB  7E        02700         LD      A,(HL)
43FC  9A        02710         SBC     A,D
            02720 ;                                 IF (A) < 0
43FD  FAB143    02730 XLOO3   JP      M,BRAN1        ; THEN LOOP AGAIN
4400  23        02740         INC     HL             ; ELSE DONE
4401  227843    02750         LD      (RPP),HL       ; DISCARD R1 & R2
4404  03        02760         INC     BC             ; SKIP BRANCH OFFSET
4405  03        02770         INC     BC
4406  C37C43    02780         JP      NEXT
            02790 ;
4409            02800         HD      7,(+LOOP,),XLOOP-9
4409  87              DEFB    7+80H
440A  28              DEFM    '(+LOOP'
440B  2B
440C  4C
440D  4F
440E  4F
440F  50
4410  A9              DEFB    ')'+80H
4411  D143            DEFW    XLOOP-9
                      ENDM
4413            02810 XPLOO   DW      $+2
4413  1544            DEFW    $+2
                      ENDM
4415  D1        02820         POP     DE             ; (DE) <- INCR
4416  18C7      02830         JR      XLOO1
            02840 ;
4418            02850         HD      4,(DO,),XPLOO-0AH
4418  84              DEFB    4+80H
4419  28              DEFM    '(DO'
441A  44
441B  4F
441C  A9              DEFB    ')'+80H
441D  0944            DEFW    XPLOO-0AH
                      ENDM
441F            02860 XDO     DW      $+2
441F  2144            DEFW    $+2
                      ENDM
4421  2A7843    02870         LD      HL,(RPP)       ; (RP) <- (RP) - 4
4424  2B        02880         DEC     HL
4425  2B        02890         DEC     HL
4426  2B        02900         DEC     HL
4427  2B        02910         DEC     HL
4428  227843    02920         LD      (RPP),HL
442B  D1        02930         POP     DE             ; (R1) <- (S1) = INIT INDEX
442C  73        02940         LD      (HL),E
442D  23        02950         INC     HL
442E  72        02960         LD      (HL),D
```

```
442F D1         02970        POP     DE          ; (R2) <- (S2) = LIMIT
4430 23         02980        INC     HL
4431 73         02990        LD      (HL),E
4432 23         03000        INC     HL
4433 72         03010        LD      (HL),D
4434 C37C43     03020        JP      NEXT
                03030 ;
4437            03040        DB      81H
4437 81                      DEFB    81H
                             ENDM
4438            03050        MB      I
4438 C9                      DEFB    'I'+80H
                             ENDM
4439            03060        DW      XDO-7
4439 1844                    DEFW    XDO-7
                             ENDM
443B            03070 IDO    DW      $+2         ; (S1) <- (R1) . (R1) UNCHAN
GED
443B 3D44                    DEFW    $+2
                             ENDM
443D 2A7843     03080        LD      HL,(RPP)
4440 5E         03090        LD      E,(HL)      ; (DE) <- (R1)
4441 23         03100        INC     HL
4442 56         03110        LD      D,(HL)
4443 D5         03120        PUSH    DE          ; (S1) <- (DE)
4444 C37C43     03130        JP      NEXT
                03140 ;
4447            03150        HD      5,DIGI,T,IDO-4
4447 85                      DEFB    5+80H
4448 44                      DEFM    'DIGI'
4449 49
444A 47
444B 49
444C D4                      DEFB    'T'+80H
444D 3744                    DEFW    IDO-4
                             ENDM
444F            03160 DIGIT  DW      $+2
444F 5144                    DEFW    $+2
                             ENDM
4451 E1         03170        POP     HL          ; (L) <- (S1)LB = ASCII CHR
4452 D1         03180        POP     DE          ; (DE) <- (S2) = BASE VALUE
4453 7B         03190        LD      A,E
4454 D630       03200        SUB     30H         ; IF CHR = "0"
4456 FA7044     03210        JP      M,DIGI2
4459 FE0A       03220        CP      0AH         ; AND IF CHR > "9"
445B FA6544     03230        JP      M,DIGI1
445E D607       03240        SUB     7
4460 FE0A       03250        CP      0AH         ; AND IF CHR >= "A"
4462 FA7044     03260        JP      M,DIGI2
                03270 ;                          THEN VALID NUMERIC OR ALPH
A CHR
4465 BD         03280 DIGI1  CP      L           ; IF < BASE VALUE
4466 F27044     03290        JP      P,DIGI2
                03300 ;                          THEN VALID DIGIT CHR
4469 5F         03310        LD      E,A         ; (S2) <- (DE) = CONVERTED D
IGIT
446A 210100     03320        LD      HL,1        ; (S1) <- TRUE
446D C37A43     03330        JP      DPUSH
```

```
                        03340 ;                              ELSE INVALID DIGIT CHR
4470 6C                 03350 DIGI2    LD       L,H          ; (HL) <- FALSE
4471 C37B43             03360         JP       HPUSH        ; (S1) <- FALSE
                        03370 ;
4474                    03380         HD       6,(FIND,),DIGIT-8
4474 86                               DEFB     6+80H
4475 28                               DEFM     '(FIND'
4476 46
4477 49
4478 4E
4479 44
447A A9                               DEFB     ')'+80H
447B 4744                             DEFW     DIGIT-8
                                      ENDM
447D                    03390 PFIND   DW       $+2
447D 7F44                             DEFW     $+2
                                      ENDM
447F D1                 03400         POP      DE           ; (DE) <- NFA
4480 E1                 03410 PFIN1   POP      HL           ; (HL) <- STRING ADDR
4481 E5                 03420         PUSH     HL           ; SAVE STRING ADDR FOR NEXT
ITERATION
4482 1A                 03430         LD       A,(DE)
4483 AE                 03440         XOR      (HL)         ; CHECK LENGTHS & SMUDGE BIT

4484 E63F               03450         AND      3FH
4486 201F               03460         JR       NZ,PFIN4     ; LENGTHS DIFFERENT
                        03470 ;                             LENGTHS MATCH. CHECK EACH CH
R
4488 23                 03480 PFIN2   INC      HL           ; (HL) <- ADDR NEXT CHR IN S
TRING
4489 13                 03490         INC      DE           ; (DE) <- ADDR NEXT CHR IN N
F
448A 1A                 03500         LD       A,(DE)
448B AE                 03510         XOR      (HL)
448C 87                 03520         ADD      A,A
448D 2016               03530         JR       NZ,PFIN3     ; NO MATCH
448F 30F7               03540         JR       NC,PFIN2     ; MATCH SO FAR. LOOP AGAIN
4491 210500             03550         LD       HL,5         ; STRING MATCHES
4494 19                 03560         ADD      HL,DE        ; ((SP)) <- PFA
4495 E3                 03570         EX       (SP),HL
                        03580 ;                             BACK UP TO LENGTH BYTE OF NF
  = NFA
4496 1B                 03590 PFIN6   DEC      DE
4497 1A                 03600         LD       A,(DE)
4498 B7                 03610         OR       A
4499 F29644             03620         JP       P,PFIN6      ; IF MSB=1 THEN (DE) = NFA
449C 5F                 03630         LD       E,A          ; (DE) <- LENGTH BYTE
449D 1600               03640         LD       D,0
449F 210100             03650         LD       HL,1         ; (HL) <- TRUE
44A2 C37A43             03660         JP       DPUSH        ; RETURN. NF FOUND
                        03670 ;       ABOVE NF NOT A MATCH, TRY ANOTHER
44A5 3806               03680 PFIN3   JR       C,PFIN5      ; IF NOT END OF NF
44A7 13                 03690 PFIN4   INC      DE           ; THEN FIND END OF NF
44A8 1A                 03700         LD       A,(DE)
44A9 B7                 03710         OR       A
44AA F2A744             03720         JP       P,PFIN4
44AD 13                 03730 PFIN5   INC      DE           ; (DE) <- LFA
44AE EB                 03740         EX       DE,HL
```

```
44AF 5E        03750            LD      E,(HL)
44B0 23        03760            INC     HL
44B1 56        03770            LD      D,(HL)
44B2 7A        03780            LD      A,D
44B3 B3        03790            OR      E               ; IF (LFA) <> 0
44B4 20CA      03800            JR      NZ,PFIN1        ; THEN TRY PREV. DICT. DEF.
               03810 ;                                      ELSE END OF DICTIONARY
44B6 E1        03820            POP     HL
44B7 210000    03830            LD      HL,0            ; (HL) <- FALSE
44BA C37B43    03840            JP      HPUSH           ;   NO MATCH
               03850 ;
44BD           03860            HD      7,ENCLOS,E,PFIND-9
44BD 87                         DEFB    7+80H
44BE 45                         DEFM    'ENCLOS'
44BF 4E
44C0 43
44C1 4C
44C2 4F
44C3 53
44C4 C5                         DEFB    'E'+80H
44C5 7444                       DEFW    PFIND-9
               ENDM
44C7           03870 ENCL       DW      $+2
44C7 C944                       DEFW    $+2
               ENDM
44C9 D1        03880            POP     DE              ; (DE) <- (S1) = DELIM
44CA E1        03890            POP     HL              ; (HL) <- (S2) = ADDR TEXT
44CB E5        03900            PUSH    HL
44CC 7B        03910            LD      A,E
44CD 57        03920            LD      D,A             ; (D) <- DELIM CHR
44CE 1EFF      03930            LD      E,0FFH          ; INIT. CHR OFFSET CNT
44D0 2B        03940            DEC     HL
               03950 ;                                  SKIP OVER LEADING DELIM. CHR
S
44D1 23        03960 ENCL1      INC     HL
44D2 1C        03970            INC     E
44D3 BE        03980            CP      (HL)            ; IF TEXT CHR = DELIM CHR
44D4 28FB      03990            JR      Z,ENCL1         ;   LOOP AGAIN
44D6 1600      04000            LD      D,0       ; ELSE S3 <- (E) = OFFSET TO 1ST NON
-DELIM
44D8 D5        04010            PUSH    DE
44D9 57        04020            LD      D,A             ; (D) <- DELIM CHR
44DA 7E        04030            LD      A,(HL)          ; IF = NULL
44DB A7        04040            AND     A
44DC 2009      04050            JR      NZ,ENCL2
44DE 1600      04060            LD      D,0             ; THEN (S2) <- OFFSET TO BYT
E
44E0 1C        04070            INC     E               ;   FOLLOWING NULL
44E1 D5        04080            PUSH    DE
44E2 1D        04090            DEC     E               ; (S1) <- OFFSET TO NULL
44E3 D5        04100            PUSH    DE
44E4 C37C43    04110            JP      NEXT
               04120 ;                            ELSE TEXT HAS NON-DELIM & NON-NULL
44E7 7A        04130 ENCL2      LD      A,D             ; (A) <- DELIM CHR
44E8 23        04140            INC     HL              ; (HL) <- ADDR NEXT CHR
44E9 1C        04150            INC     E               ; (E) <- OFFSET TO NEXT CHR
44EA BE        04160            CP      (HL)            ; IF NEXT CHR <> DELIM
44EB 280B      04170            JR      Z,ENCL4
```

```
44ED 7E      04180         LD      A,(HL)           ; & IF NEXT CHR <> NULL
44EE A7      04190         AND     A
44EF 20F6    04200         JR      NZ,ENCL2         ; THEN CONT.
             04210 ;                                 ELSE CHR = NULL
44F1 1600    04220 ENCL3   LD      D,0              ; (S2),(S1) <- OFFSET TO NUL
L
44F3 D5      04230         PUSH    DE
44F4 D5      04240         PUSH    DE
44F5 C37C43  04250         JP      NEXT
             04260 ;                                 ELSE CHR = DELIM CHR
44F8 1600    04270 ENCL4   LD      D,0              ; (S2) <- OFFSET TO BYTE
             04280 ;                                     FOLLOWING TEXT
44FA D5      04290         PUSH    DE
44FB 1C      04300         INC     E                ; (S1) <- OFFSET TO 2 BYTES
             04310 ;                                     AFTER END
44FC D5      04320         PUSH    DE
44FD C37C43  04330         JP      NEXT
             04340 ;
4500         04350         HD      4,EMI,T,ENCL-0AH
4500 84                    DEFB    4+80H
4501 45                    DEFM    'EMI'
4502 4D
4503 49
4504 D4                    DEFB    'T'+80H
4505 BD44                  DEFW    ENCL-0AH
                           ENDM
4507         04360 EMIT    DW6     DOCOL,PEMIT,ONE,OUTT,PSTOR,SEMIS
4507 2448                  DEFW    DOCOL
4509 5957                  DEFW    PEMIT
450B AA48                  DEFW    ONE
450D 8149                  DEFW    OUTT
450F 8547                  DEFW    PSTOR
4511 5B46                  DEFW    SEMIS
                           ENDM
             04370 ;
4513         04380         HD      3,KE,Y,EMIT-7
4513 83                    DEFB    3+80H
4514 4B                    DEFM    'KE'
4515 45
4516 D9                    DEFB    'Y'+80H
4517 0045                  DEFW    EMIT-7
                           ENDM
4519         04390 KEY     DW      $+2
4519 1B45                  DEFW    $+2
                           ENDM
451B C36B57  04400         JP      PKEY
             04410 ;
451E         04420         HD      9,?TERMINA,L,KEY-6
451E 89                   DEFB    9+80H
451F 3F                   DEFM    '?TERMINA'
4520 54
4521 45
4522 52
4523 4D
4524 49
4525 4E
4526 41
4527 CC                   DEFB    'L'+80H
```

```
4528  1345                        DEFW    KEY-6
                                  ENDM
452A              04430 QTERM     DW      $+2
452A  2C45                        DEFW    $+2
                                  ENDM
452C  210000      04440          LD      HL,0
452F  C37657      04450          JP      PQTER
                  04460 ;
4532              04470          HD      2,C,R,QTERM-0CH
4532  82                          DEFB    2+80H
4533  43                          DEFM    ' C'
4534  D2                          DEFB    ' R' +80H
4535  1E45                        DEFW    QTERM-0CH
                                  ENDM
4537              04480 CR        DW      $+2
4537  3945                        DEFW    $+2
                                  ENDM
4539  C38B57      04490          JP      PCR
                  04500 ;
453C              04510          HD      5,CMOV,E,CR-5
453C  85                          DEFB    5+80H
453D  43                          DEFM    ' CMOV'
453E  4D
453F  4F
4540  56
4541  C5                          DEFB    ' E' +80H
4542  3245                        DEFW    CR-5
                                  ENDM
4544              04520 CMOVE     DW      $+2
4544  4645                        DEFW    $+2
                                  ENDM
4546  69          04530          LD      L,C
4547  60          04540          LD      H,B
4548  C1          04550          POP     BC
4549  D1          04560          POP     DE
454A  E3          04570          EX      (SP),HL
454B  EDB0        04580          LDIR
454D  C1          04590          POP     BC
454E  C37C43      04600          JP      NEXT
                  04610 ;
4551              04620          HD      2,U,*,CMOVE-8
4551  82                          DEFB    2+80H
4552  55                          DEFM    ' U'
4553  AA                          DEFB    ' *' +80H
4554  3C45                        DEFW    CMOVE-8
                                  ENDM
4556              04630 USTAR     DW      $+2
4556  5845                        DEFW    $+2
                                  ENDM
4558  D1          04640          POP     DE              ; (DE) <- MPLIER
4559  E1          04650          POP     HL              ; (HL) <- MPCAND
455A  C5          04660          PUSH    BC              ; SAVE IP
455B  44          04670          LD      B,H
455C  7D          04680          LD      A,L             ; (BA) <- MPCAND
455D  CD7445      04690          CALL    MPYX            ; (AHL)1 <- MPCAND.HB*MPLIER

                  04700 ;                                        1ST PARTIAL PRODUCT
4560  E5          04710          PUSH    HL              ; SAVE (HL)1
```

```
4561 67        04720        LD    H,A
4562 78        04730        LD    A,B
4563 44        04740        LD    B,H           ; SAVE (A)1
4564 CD7445    04750        CALL  MPYX          ; (AHL)2 <- MPCAND.LB*MPLIER

               04760 ;                                    2ND PARTIAL PRODUCT
4567 D1        04770        POP   DE            ; (DE) <- (HL)1
4568 4A        04780        LD    C,D           ; (BC) <- (AH)1
               04790 ;
               04800 ;      FORM SUM OF PARTIALS
               04810 ;                (AHL)    1
               04820 ;            + (AHL)      2
               04830 ;                ----
               04840 ;                (AHLE)
               04850 ;
4569 09        04860        ADD   HL,BC         ; (HL) <- (HL)2 + (AH)1
456A CE00      04870        ADC   A,0           ; (AHLE) <- (BA)*(DE)
456C 55        04880        LD    D,L
456D 6C        04890        LD    L,H
456E 67        04900        LD    H,A           ; (HLDE) <- MPLIER * MPCAND
456F C1        04910        POP   BC            ; RESTORE IP
4570 D5        04920        PUSH  DE            ; (S2) <- PRODUCT.LW
4571 C37B43    04930        JP    HPUSH         ; (S1) <- PRODUCT.HW
               04940 ;
               04950 ; MULTIPLY PRIMITIVE  24 BITS = 8 * 16
               04960 ;
               04970 ;      (AHL) <- (A) * (DE)
               04980 ; #BITS=  24       8       16
               04990 ;
4574 210000    05000 MPYX   LD    HL,0          ; (HL) <- 0 = PARTIAL PRODUC
T.LW
4577 0E08      05010        LD    C,8           ; LOOP COUNTER
4579 29        05020 MPYX1  ADD   HL,HL         ; LEFT SHIFT (AHL) 24 BITS
457A 17        05030        RLA
457B D28145    05040        JP    NC,MPYX2      ; IF NEXT MPLIER BIT = 1
457E 19        05050        ADD   HL,DE         ; THEN ADD MPCAND
457F CE00      05060        ADC   A,0
4581 0D        05070 MPYX2  DEC   C             ; IF NOT LAST MPLIER BIT
4582 20F5      05080        JR    NZ,MPYX1      ; THEN LOOP AGAIN
4584 C9        05090        RET                 ; ELSE DONE
               05100 ;
4585           05110        HD    2,U,/,USTAR-5
4585 82                     DEFB  2+80H
4586 55                     DEFM  'U'
4587 AF                     DEFB  '/'+80H
4588 5145                   DEFW  USTAR-5
                            ENDM
458A           05120 USLAS  DW    $+2
458A 8C45                   DEFW  $+2
                            ENDM
458C 210400    05130        LD    HL,4
458F 39        05140        ADD   HL,SP         ; ((HL)) <- NUMERATOR.LW
4590 5E        05150        LD    E,(HL)        ; (DE) <- NUMER.LW
4591 71        05160        LD    (HL),C        ; SAVE IP ON STACK
4592 23        05170        INC   HL
4593 56        05180        LD    D,(HL)
4594 70        05190        LD    (HL),B
4595 C1        05200        POP   BC            ; (BC) <- DENOMINATOR
```

```
4596 E1        05210         POP    HL            ; (HL) <- NUMER.HW
4597 7D        05220         LD     A,L
4598 91        05230         SUB    C             ; IF NUMER >= DENOM
4599 7C        05240         LD     A,H
459A 98        05250         SBC    A,B
459B 3808      05260         JR     C,USLA1
459D 21FFFF    05270         LD     HL,0FFFFH     ; THEN OVERFLOW
45A0 11FFFF    05280         LD     DE,0FFFFH     ; SET REM & QUOT TO MAX
45A3 1826      05290         JR     USLA7
45A5 3E10      05300 USLA1   LD     A,16          ; LOOP COUNTER
45A7 29        05310 USLA2   ADD    HL,HL         ; SHIFT LEFT (HLDE) THRU CAR
RY
45A8 17        05320         RLA
45A9 EB        05330         EX     DE,HL
45AA 29        05340         ADD    HL,HL
45AB 3002      05350         JR     NC,USLA3
45AD 13        05360         INC    DE
45AE A7        05370         AND    A
45AF EB        05380 USLA3   EX     DE,HL         ; SHIFT DONE
45B0 1F        05390         RRA                  ; RESTORE 1ST CARRY
45B1 F5        05400         PUSH   AF            ; SAVE COUNTER
45B2 3008      05410         JR     NC,USLA4      ; IF CARRY = 1
45B4 7D        05420         LD     A,L           ; THEN (HL) <- (HL) - (BC)
45B5 91        05430         SUB    C
45B6 6F        05440         LD     L,A
45B7 7C        05450         LD     A,H
45B8 98        05460         SBC    A,B
45B9 67        05470         LD     H,A
45BA 180A      05480         JR     USLA5
45BC 7D        05490 USLA4   LD     A,L           ; ELSE TRY (HL) <- (HL) - (B
C)
45BD 91        05500         SUB    C
45BE 6F        05510         LD     L,A
45BF 7C        05520         LD     A,H
45C0 98        05530         SBC    A,B           ; (HL) <- PARTIAL REMAINDER
45C1 67        05540         LD     H,A
45C2 3002      05550         JR     NC,USLA5
45C4 09        05560         ADD    HL,BC         ; UNDERFLOW, RESTORE
45C5 1B        05570         DEC    DE
45C6 13        05580 USLA5   INC    DE            ; INC QUOT
45C7 F1        05590 USLA6   POP    AF            ; RESTORE COUNTER
45C8 3D        05600         DEC    A             ; IF COUNTER > 0
45C9 20DC      05610         JR     NZ,USLA2      ;   THEN LOOP AGAIN
45CB C1        05620 USLA7   POP    BC            ;   ELSE DONE. RESTORE IP
45CC E5        05630         PUSH   HL            ; (S2) <- REMAINDER
45CD D5        05640         PUSH   DE            ; (S1) <- QUOTIENT
45CE C37C43    05650         JP     NEXT
              05660 ;
45D1          05670         HD     3,AN,D,USLA5-5
45D1 83                     DEFB   3+80H
45D2 41                     DEFM   'AN'
45D3 4E
45D4 C4                     DEFB   'D'+80H
45D5 8545                   DEFW   USLA5-5
                            ENDM
45D7          05680 ANDD    DW     $+2
45D7 D945                   DEFW   $+2
                            ENDM
```

```
45D9  D1          05690         POP     DE
45DA  E1          05700         POP     HL
45DB  7B          05710         LD      A,E
45DC  A5          05720         AND     L
45DD  6F          05730         LD      L,A
45DE  7A          05740         LD      A,D
45DF  A4          05750         AND     H
45E0  67          05760         LD      H,A
45E1  C37B43      05770         JP      HPUSH
                  05780 ;
45E4              05790         HD      2,O,R,ANDD-6
45E4  82                        DEFB    2+80H
45E5  4F                        DEFM    'O'
45E6  D2                        DEFB    'R'+80H
45E7  D145                      DEFW    ANDD-6
                                ENDM
45E9              05800 ORR     DW      $+2
45E9  EB45                      DEFW    $+2
                                ENDM
45EB  D1          05810         POP     DE
45EC  E1          05820         POP     HL
45ED  7B          05830         LD      A,E
45EE  B5          05840         OR      L
45EF  6F          05850         LD      L,A
45F0  7A          05860         LD      A,D
45F1  B4          05870         OR      H
45F2  67          05880         LD      H,A
45F3  C37B43      05890         JP      HPUSH
                  05900 ;
45F6              05910         HD      3,XO,R,ORR-5
45F6  83                        DEFB    3+80H
45F7  58                        DEFM    'XO'
45F8  4F
45F9  D2                        DEFB    'R'+80H
45FA  E445                      DEFW    ORR-5
                                ENDM
45FC              05920 XORR    DW      $+2
45FC  FE45                      DEFW    $+2
                                ENDM
45FE  D1          05930         POP     DE
45FF  E1          05940         POP     HL
4600  7B          05950         LD      A,E
4601  AD          05960         XOR     L
4602  6F          05970         LD      L,A
4603  7A          05980         LD      A,D
4604  AC          05990         XOR     H
4605  67          06000         LD      H,A
4606  C37B43      06010         JP      HPUSH
                  06020 ;
4609              06030         HD      3,SP,●,XORR-6
4609  83                        DEFB    3+80H
460A  53                        DEFM    'SP'
460B  50
460C  C0                        DEFB    '●'+80H
460D  F645                      DEFW    XORR-6
                                ENDM
460F              06040 SPAT    DW      $+2
460F  1146                      DEFW    $+2
```

```
                            ENDM
4611 210000    06050        LD      HL,0
4614 39        06060        ADD     HL,SP
4615 C37B43    06070        JP      HPUSH
               06080 ;
4618           06090        HD      3,SP,!,SPAT-6
4618 83                     DEFB    3+80H
4619 53                     DEFM    ' SP'
461A 50
461B A1                     DEFB    ' !' +80H
461C 0946                   DEFW    SPAT-6
                            ENDM
461E           06100 SPSTO  DW      $+2
461E 2046                   DEFW    $+2
                            ENDM
4620 2A7643    06110        LD      HL,(UP)
4623 110600    06120        LD      DE,6
4626 19        06130        ADD     HL,DE
4627 5E        06140        LD      E,(HL)
4628 23        06150        INC     HL
4629 56        06160        LD      D,(HL)
462A EB        06170        EX      DE,HL
462B F9        06180        LD      SP,HL
462C C37C43    06190        JP      NEXT
               06200 ;
462F           06210        HD      3,RP,@,SPSTO-6
462F 83                     DEFB    3+80H
4630 52                     DEFM    ' RP'
4631 50
4632 C0                     DEFB    ' @' +80H
4633 1846                   DEFW    SPSTO-6
                            ENDM
4635           06220 RPAT   DW      $+2
4635 3746                   DEFW    $+2
                            ENDM
4637 2A7843    06230        LD      HL,(RPP)
463A C37B43    06240        JP      HPUSH
               06250 ;
463D           06260        HD      3,RP,!,RPAT-6
463D 83                     DEFB    3+80H
463E 52                     DEFM    ' RP'
463F 50
4640 A1                     DEFB    ' !' +80H
4641 2F46                   DEFW    RPAT-6
                            ENDM
4643           06270 RPSTO  DW      $+2
4643 4546                   DEFW    $+2
                            ENDM
4645 2A7643    06280        LD      HL,(UP)
4648 110800    06290        LD      DE,8
464B 19        06300        ADD     HL,DE
464C 5E        06310        LD      E,(HL)
464D 23        06320        INC     HL
464E 56        06330        LD      D,(HL)
464F EB        06340        EX      DE,HL
4650 227843    06350        LD      (RPP),HL
4653 C37C43    06360        JP      NEXT
               06370 ;
```

```
4656              06380        DB      82H
4656 82                        DEFB    82H
                               ENDM
4657 3B           06390        DEFM    ';'
4658              06400        MB      S
4658 D3                        DEFB    'S'+80H
                               ENDM
4659              06410        DW      RPSTO-6
4659 3D46                      DEFW    RPSTO-6
                               ENDM
465B              06420 SEMIS  DW      $+2
465B 5D46                      DEFW    $+2
                               ENDM
465D 2A7843       06430        LD      HL,(RPP)
4660 4E           06440        LD      C,(HL)
4661 23           06450        INC     HL
4662 46           06460        LD      B,(HL)
4663 23           06470        INC     HL
4664 227843       06480        LD      (RPP),HL
4667 C37C43       06490        JP      NEXT
                  06500 ;
466A              06510        HD      5,LEAV,E,SEMIS-5
466A 85                        DEFB    5+80H
466B 4C                        DEFM    'LEAV'
466C 45
466D 41
466E 56
466F C5                        DEFB    'E'+80H
4670 5646                      DEFW    SEMIS-5
                               ENDM
4672              06520 LEAVE  DW      $+2
4672 7446                      DEFW    $+2
                               ENDM
4674 2A7843       06530        LD      HL,(RPP)
4677 5E           06540        LD      E,(HL)
4678 23           06550        INC     HL
4679 56           06560        LD      D,(HL)
467A 23           06570        INC     HL
467B 73           06580        LD      (HL),E
467C 23           06590        INC     HL
467D 72           06600        LD      (HL),D
467E C37C43       06610        JP      NEXT
                  06620 ;
4681              06630        HD      2,>,R,LEAVE-8
4681 82                        DEFB    2+80H
4682 3E                        DEFM    '>'
4683 D2                        DEFB    'R'+80H
4684 6A46                      DEFW    LEAVE-8
                               ENDM
4686              06640 TOR    DW      $+2
4686 8846                      DEFW    $+2
                               ENDM
4688 D1           06650        POP     DE
4689 2A7843       06660        LD      HL,(RPP)
468C 2B           06670        DEC     HL
468D 2B           06680        DEC     HL
468E 227843       06690        LD      (RPP),HL
4691 73           06700        LD      (HL),E
```

```
4692 23        06710         INC     HL
4693 72        06720         LD      (HL),D
4694 C37C43    06730         JP      NEXT
               06740 ;
4697           06750         HD      2,R,>,TOR-5
4697 82                      DEFB    2+80H
4698 52                      DEFM    'R'
4699 BE                      DEFB    '>'+80H
469A 8146                    DEFW    TOR-5
                             ENDM
469C           06760 FROMR   DW      $+2
469C 9E46                    DEFW    $+2
                             ENDM
469E 2A7843    06770         LD      HL,(RPP)
46A1 5E        06780         LD      E,(HL)
46A2 23        06790         INC     HL
46A3 56        06800         LD      D,(HL)
46A4 23        06810         INC     HL
46A5 227843    06820         LD      (RPP),HL
46A8 D5        06830         PUSH    DE
46A9 C37C43    06840         JP      NEXT
               06850 ;
46AC           06860         DB      81H
46AC 81                      DEFB    81H
                             ENDM
46AD           06870         MB      R
46AD D2                      DEFB    'R'+80H
                             ENDM
46AE           06880         DW      FROMR-5
46AE 9746                    DEFW    FROMR-5
                             ENDM
46B0           06890 RR      DW      IDO+2
46B0 3D44                    DEFW    IDO+2
                             ENDM
               06900 ;
46B2           06910         HD      2,0,=,RR-4
46B2 82                      DEFB    2+80H
46B3 30                      DEFM    '0'
46B4 BD                      DEFB    '='+80H
46B5 AC46                    DEFW    RR-4
                             ENDM
46B7           06920 ZEQU    DW      $+2
46B7 B946                    DEFW    $+2
                             ENDM
46B9 E1        06930         POP     HL
46BA 7D        06940         LD      A,L
46BB B4        06950         OR      H
46BC 210000    06960         LD      HL,0
46BF 2001      06970         JR      NZ,ZEQU1
46C1 23        06980         INC     HL
46C2 C37B43    06990 ZEQU1   JP      HPUSH
               07000 ;
46C5           07010         HD      2,0,<,ZEQU-5
46C5 82                      DEFB    2+80H
46C6 30                      DEFM    '0'
46C7 BC                      DEFB    '<'+80H
46C8 B246                    DEFW    ZEQU-5
                             ENDM
```

```
46CA            07020 ZLESS   DW      $+2
46CA CC46                     DEFW    $+2
                              ENDM
46CC E1         07030         POP     HL
46CD 29         07040         ADD     HL,HL
46CE 210000     07050         LD      HL,0
46D1 D2D546     07060         JP      NC,ZLES1
46D4 23         07070         INC     HL
46D5 C37B43     07080 ZLES1   JP      HPUSH
                07090 ;
46D8            07100         DB      81H
46D8 81                       DEFB    81H
                              ENDM
46D9            07110         MB      +
46D9 AB                       DEFB    '+'+80H
                              ENDM
46DA            07120         DW      ZLESS-5
46DA C546                     DEFW    ZLESS-5
                              ENDM
46DC            07130 PLUS    DW      $+2
46DC DE46                     DEFW    $+2
                              ENDM
46DE D1         07140         POP     DE
46DF E1         07150         POP     HL
46E0 19         07160         ADD     HL,DE
46E1 C37B43     07170         JP      HPUSH
                07180 ;
46E4            07190         HD      2,D,+,PLUS-4      ; XLW XHW YLW YHW --- SLW SH
W
46E4 82                       DEFB    2+80H
46E5 44                       DEFM    'D'
46E6 AB                       DEFB    '+'+80H
46E7 D846                     DEFW    PLUS-4
                              ENDM
46E9            07200 DPLUS   DW      $+2               ;  S4  S3  S2  S1      S2  S
1
46E9 EB46                     DEFW    $+2
                              ENDM
46EB 210600     07210         LD      HL,6
46EE 39         07220         ADD     HL,SP   ; ((HL)) = XLW
46EF 5E         07230         LD      E,(HL)  ; (DE) = XLW
46F0 71         07240         LD      (HL),C  ; SAVE IP ON STACK
46F1 23         07250         INC     HL
46F2 56         07260         LD      D,(HL)
46F3 70         07270         LD      (HL),B
46F4 C1         07280         POP     BC      ; (BC) <- YHW
46F5 E1         07290         POP     HL      ; (HL) <- YLW
46F6 19         07300         ADD     HL,DE
46F7 EB         07310         EX      DE,HL   ; (DE) <- YLW+XLW = SUM.LW
46F8 E1         07320         POP     HL      ; (HL) <- XHW
46F9 7D         07330         LD      A,L
46FA 89         07340         ADC     A,C
46FB 6F         07350         LD      L,A     ; (HL) <- YHW+XHW + CARRY
46FC 7C         07360         LD      A,H
46FD 88         07370         ADC     A,B
46FE 67         07380         LD      H,A
46FF C1         07390         POP     BC      ; RESTORE IP
4700 D5         07400         PUSH    DE      ; (S2) <- SUM.LW
```

```
4701 C37B43      07410        JP      HPUSH    ; (S1) <- SUM.HW
                 07420 ;
4704             07430        HD      5,MINU,S,DPLUS-5
4704 85                       DEFB    5+80H
4705 4D                       DEFM    'MINU'
4706 49
4707 4E
4708 55
4709 D3                       DEFB    'S'+80H
470A E446                     DEFW    DPLUS-5
                              ENDM
470C             07440 MINUS  DW      $+2
470C 0E47                     DEFW    $+2
                              ENDM
470E E1          07450        POP     HL
470F 7D          07460        LD      A,L
4710 2F          07470        CPL
4711 6F          07480        LD      L,A
4712 7C          07490        LD      A,H
4713 2F          07500        CPL
4714 67          07510        LD      H,A
4715 23          07520        INC     HL
4716 C37B43      07530        JP      HPUSH
                 07540 ;
4719             07550        HD      6,DMINU,S,MINUS-8
4719 86                       DEFB    6+80H
471A 44                       DEFM    'DMINU'
471B 4D
471C 49
471D 4E
471E 55
471F D3                       DEFB    'S'+80H
4720 0447                     DEFW    MINUS-8
                              ENDM
4722             07560 DMINU  DW      $+2
4722 2447                     DEFW    $+2
                              ENDM
4724 E1          07570        POP     HL       ; (HL) <- HW
4725 D1          07580        POP     DE       ; (DE) <- LW
4726 97          07590        SUB     A
4727 93          07600        SUB     E        ; (DE) <- 0 - (DE)
4728 5F          07610        LD      E,A
4729 3E00        07620        LD      A,0
472B 9A          07630        SBC     A,D
472C 57          07640        LD      D,A
472D 3E00        07650        LD      A,0
472F 9D          07660        SBC     A,L      ; (HL) <- 0 - (HL)
4730 6F          07670        LD      L,A
4731 3E00        07680        LD      A,0
4733 9C          07690        SBC     A,H
4734 67          07700        LD      H,A
4735 D5          07710        PUSH    DE       ; (S2) <- LW
4736 C37B43      07720        JP      HPUSH    ; (S1) <- HW
                 07730 ;
4739             07740        HD      4,OVE,R,DMINU-9
4739 84                       DEFB    4+80H
473A 4F                       DEFM    'OVE'
473B 56
```

```
473C  45
473D  D2              DEFB    'R'+80H
473E  1947            DEFW    DMINU-9
                      ENDM
4740          07750 OVER  DW      $+2
4740  4247            DEFW    $+2
                      ENDM
4742  D1      07760   POP     DE
4743  E1      07770   POP     HL
4744  E5      07780   PUSH    HL
4745  C37A43  07790   JP      DPUSH
              07800 ;
4748          07810   HD      4,DRO,P,OVER-7
4748  84              DEFB    4+80H
4749  44              DEFM    'DRO'
474A  52
474B  4F
474C  D0              DEFB    'P'+80H
474D  3947            DEFW    OVER-7
                      ENDM
474F          07820 DROP  DW      $+2
474F  5147            DEFW    $+2
                      ENDM
4751  E1      07830   POP     HL
4752  C37C43  07840   JP      NEXT
              07850 ;
4755          07860   HD      4,SWA,P,DROP-7
4755  84              DEFB    4+80H
4756  53              DEFM    'SWA'
4757  57
4758  41
4759  D0              DEFB    'P'+80H
475A  4847            DEFW    DROP-7
                      ENDM
475C          07870 SWAP  DW      $+2
475C  5E47            DEFW    $+2
                      ENDM
475E  E1      07880   POP     HL
475F  E3      07890   EX      (SP),HL
4760  C37B43  07900   JP      HPUSH
              07910 ;
4763          07920   HD      3,DU,P,SWAP-7
4763  83              DEFB    3+80H
4764  44              DEFM    'DU'
4765  55
4766  D0              DEFB    'P'+80H
4767  5547            DEFW    SWAP-7
                      ENDM
4769          07930 DUP   DW      $+2
4769  6B47            DEFW    $+2
                      ENDM
476B  E1      07940   POP     HL
476C  E5      07950   PUSH    HL
476D  C37B43  07960   JP      HPUSH
              07970 ;
4770          07980   HD      4,2DU,P,DUP-6
4770  84              DEFB    4+80H
4771  32              DEFM    '2DU'
```

```
4772 44
4773 55
4774 D0              DEFB    'P'+80H
4775 6347           DEFW    DUP-6
                    ENDM
4777         07990 TDUP DW    $+2
4777 7947           DEFW    $+2
                    ENDM
4779 E1     08000   POP     HL
477A D1     08010   POP     DE
477B D5     08020   PUSH    DE
477C E5     08030   PUSH    HL
477D C37A43 08040   JP      DPUSH
            08050 ;
4780        08060   HD      2,+,!,TDUP-7
4780 82             DEFB    2+80H
4781 2B             DEFM    '+'
4782 A1             DEFB    '!'+80H
4783 7047           DEFW    TDUP-7
                    ENDM
4785        08070 PSTOR DW   $+2
4785 8747           DEFW    $+2
                    ENDM
4787 E1     08080   POP     HL
4788 D1     08090   POP     DE
4789 7E     08100   LD      A,(HL)
478A 83     08110   ADD     A,E
478B 77     08120   LD      (HL),A
478C 23     08130   INC     HL
478D 7E     08140   LD      A,(HL)
478E 8A     08150   ADC     A,D
478F 77     08160   LD      (HL),A
4790 C37C43 08170   JP      NEXT
            08180 ;
4793        08190   HD      6,TOGGL,E,PSTOR-5
4793 86             DEFB    6+80H
4794 54             DEFM    'TOGGL'
4795 4F
4796 47
4797 47
4798 4C
4799 C5             DEFB    'E'+80H
479A 8047           DEFW    PSTOR-5
                    ENDM
479C        08200 TOGGL DW   $+2
479C 9E47           DEFW    $+2
                    ENDM
479E D1     08210   POP     DE
479F E1     08220   POP     HL
47A0 7E     08230   LD      A,(HL)
47A1 AB     08240   XOR     E
47A2 77     08250   LD      (HL),A
47A3 C37C43 08260   JP      NEXT
            08270 ;
47A6        08280   DB      81H
47A6 81             DEFB    81H
                    ENDM
47A7        08290   MB      @
```

```
47A7  C0                              DEFB     '@'+80H
                                      ENDM
47A8             08300                DW       TOGGL-9
47A8  9347                            DEFW     TOGGL-9
                                      ENDM
47AA             08310 AT             DW       $+2
47AA  AC47                            DEFW     $+2
                                      ENDM
47AC  E1         08320                POP      HL
47AD  5E         08330                LD       E,(HL)
47AE  23         08340                INC      HL
47AF  56         08350                LD       D,(HL)
47B0  D5         08360                PUSH     DE
47B1  C37C43     08370                JP       NEXT
                 08380 ;
47B4             08390                HD       2,C,@,AT-4
47B4  82                              DEFB     2+80H
47B5  43                              DEFM     'C'
47B6  C0                              DEFB     '@'+80H
47B7  A647                            DEFW     AT-4
                                      ENDM
47B9             08400 CAT            DW       $+2
47B9  BB47                            DEFW     $+2
                                      ENDM
47BB  E1         08410                POP      HL
47BC  6E         08420                LD       L,(HL)
47BD  2600       08430                LD       H,0
47BF  C37B43     08440                JP       HPUSH
                 08450 ;
47C2             08460                HD       2,2,@,CAT-5
47C2  82                              DEFB     2+80H
47C3  32                              DEFM     '2'
47C4  C0                              DEFB     '@'+80H
47C5  B447                            DEFW     CAT-5
                                      ENDM
47C7             08470 TAT            DW       $+2
47C7  C947                            DEFW     $+2
                                      ENDM
47C9  E1         08480                POP      HL
47CA  110200     08490                LD       DE,2
47CD  19         08500                ADD      HL,DE
47CE  5E         08510                LD       E,(HL)
47CF  23         08520                INC      HL
47D0  56         08530                LD       D,(HL)
47D1  D5         08540                PUSH     DE
47D2  11FDFF     08550                LD       DE,-3
47D5  19         08560                ADD      HL,DE
47D6  5E         08570                LD       E,(HL)
47D7  23         08580                INC      HL
47D8  56         08590                LD       D,(HL)
47D9  D5         08600                PUSH     DE
47DA  C37C43     08610                JP       NEXT
                 08620 ;
47DD             08630                DB       81H
47DD  81                              DEFB     81H
                                      ENDM
47DE             08640                MB       !
47DE  A1                              DEFB     '!'+80H
```

```
                           ENDM
47DF            08650      DW       TAT-5
47DF C247                  DEFW     TAT-5
                           ENDM
47E1            08660 STORE DW      $+2
47E1 E347                  DEFW     $+2
                           ENDM
47E3 E1         08670      POP      HL
47E4 D1         08680      POP      DE
47E5 73         08690      LD       (HL),E
47E6 23         08700      INC      HL
47E7 72         08710      LD       (HL),D
47E8 C37C43     08720      JP       NEXT
                08730 ;
47EB            08740      HD       2,C,!,STORE-4
47EB 82                    DEFB     2+80H
47EC 43                    DEFM     'C'
47ED A1                    DEFB     '!'+80H
47EE DD47                  DEFW     STORE-4
                           ENDM
47F0            08750 CSTOR DW      $+2
47F0 F247                  DEFW     $+2
                           ENDM
47F2 E1         08760      POP      HL
47F3 D1         08770      POP      DE
47F4 73         08780      LD       (HL),E
47F5 C37C43     08790      JP       NEXT
                08800 ;                 .
47F8            08810      HD       2,2,!,CSTOR-5
47F8 82                    DEFB     2+80H
47F9 32                    DEFM     '2'
47FA A1                    DEFB     '!'+80H
47FB EB47                  DEFW     CSTOR-5
                           ENDM
47FD            08820 TSTOR DW      $+2
47FD FF47                  DEFW     $+2
                           ENDM
47FF E1         08830      POP      HL
4800 D1         08840      POP      DE
4801 73         08850      LD       (HL),E
4802 23         08860      INC      HL
4803 72         08870      LD       (HL),D
4804 23         08880      INC      HL
4805 D1         08890      POP      DE
4806 73         08900      LD       (HL),E
4807 23         08910      INC      HL
4808 72         08920      LD       (HL),D
4809 C37C43     08930      JP       NEXT
                08940 ;
480C            08950      DB       0C1H
480C C1                    DEFB     0C1H
                           ENDM
480D            08960      MB       :
480D BA                    DEFB     ':'+80H
                           ENDM
480E            08970      DW       TSTOR-5
480E F847                  DEFW     TSTOR-5
                           ENDM
```

```
4810              08980 COLON   DW5     DOCOL,QEXEC,SCSP,CURR,AT
4810 2448                       DEFW    DOCOL
4812 BD4B                       DEFW    QEXEC
4814 784B                       DEFW    SCSP
4816 B049                       DEFW    CURR
4818 AA47                       DEFW    AT
                                ENDM
481A              08990         DW5     CONT,STORE,CREAT,RBRAC,PSCOD
481A A349                       DEFW    CONT
481C E147                       DEFW    STORE
481E 9050                       DEFW    CREAT
4820 424C                       DEFW    RBRAC
4822 954C                       DEFW    PSCOD
                                ENDM
4824 2A7843       09000 DOCOL   LD      HL,(RPP)
4827 2B           09010         DEC     HL
4828 70           09020         LD      (HL),B
4829 2B           09030         DEC     HL
482A 71           09040         LD      (HL),C
482B 227843       09050         LD      (RPP),HL
482E 13           09060         INC     DE
482F 4B           09070         LD      C,E
4830 42           09080         LD      B,D
4831 C37C43       09090         JP      NEXT
                  09100 ;
4834              09110         DB      0C1H
4834 C1                         DEFB    0C1H
                                ENDM
4835 BB           09120         DEFB    ';'+80H
4836              09130         DW      COLON-4
4836 0C48                       DEFW    COLON-4
                                ENDM
4838              09140 SEMI    DW7     DOCOL,QCSP,COMP,SEMIS,SMUDG.LBRAC.SEMIS
4838 2448                       DEFW    DOCOL
483A E74B                       DEFW    QCSP
483C 1E4C                       DEFW    COMP
483E 5B46                       DEFW    SEMIS
4840 574C                       DEFW    SMUDG
4842 344C                       DEFW    LBRAC
4844 5B46                       DEFW    SEMIS
                                ENDM
                  09150 ;
4846              09160         HD      4,NOO,P,SEMI-4
4846 84                         DEFB    4+80H
4847 4E                         DEFM    'NOO'
4848 4F
4849 4F
484A D0                         DEFB    'P'+80H
484B 3448                       DEFW    SEMI-4
                                ENDM
484D              09170 NOOP    DW2     DOCOL,SEMIS
484D 2448                       DEFW    DOCOL
484F 5B46                       DEFW    SEMIS
                                ENDM
                  09180 ;
4851              09190         HD      8,CONSTAN,T,NOOP-7
4851 88                         DEFB    8+80H
4852 43                         DEFM    'CONSTAN'
```

```
4853 4F
4854 4E
4855 53
4856 54
4857 41
4858 4E
4859 D4                          DEFB     'T'+80H
485A 4648                        DEFW     NOOP-7
                                 ENDM
485C          09200 CON          DW5      DOCOL,CREAT,SMUDG,COMMA,PSCOD
485C 2448                        DEFW     DOCOL
485E 9050                        DEFW     CREAT
4860 574C                        DEFW     SMUDG
4862 324A                        DEFW     COMMA
4864 954C                        DEFW     PSCOD
                                 ENDM
4866 13       09210 DOCON        INC      DE
4867 EB       09220              EX       DE,HL
4868 5E       09230              LD       E,(HL)
4869 23       09240              INC      HL
486A 56       09250              LD       D,(HL)
486B D5       09260              PUSH     DE
486C C37C43   09270              JP       NEXT
              09280 ;
486F          09290              HD       8,VARIABL,E,CON-0BH
486F 88                          DEFB     8+80H
4870 56                          DEFM     'VARIABL'
4871 41
4872 52
4873 49
4874 41
4875 42
4876 4C
4877 C5                          DEFB     'E'+80H
4878 5148                        DEFW     CON-0BH
                                 ENDM
487A          09300 VAR          DW3      DOCOL,CON,PSCOD
487A 2448                        DEFW     DOCOL
487C 5C48                        DEFW     CON
487E 954C                        DEFW     PSCOD
                                 ENDM
4880 13       09310 DOVAR        INC      DE
4881 D5       09320              PUSH     DE
4882 C37C43   09330              JP       NEXT
              09340 ;
4885          09350              HD       4,USE,R,VAR-0BH
4885 84                          DEFB     4+80H
4886 55                          DEFM     'USE'
4887 53
4888 45
4889 D2                          DEFB     'R'+80H
488A 6F48                        DEFW     VAR-0BH
                                 ENDM
488C          09360 USER         DW3      DOCOL,CON,PSCOD
488C 2448                        DEFW     DOCOL
488E 5C48                        DEFW     CON
4890 954C                        DEFW     PSCOD
                                 ENDM
```

```
4892 13        09370 DOUSE    INC    DE
4893 EB        09380         EX     DE,HL
4894 5E        09390         LD     E,(HL)
4895 1600      09400         LD     D,0
4897 2A7643    09410         LD     HL,(UP)
489A 19        09420         ADD    HL,DE
489B C37B43    09430         JP     HPUSH
               09440 ;
489E           09450         DB     81H
489E 81                      DEFB   81H
                             ENDM
489F           09460         MB     0
489F B0                      DEFB   '0'+80H
                             ENDM
48A0           09470         DW     USER-7
48A0 8548                    DEFW   USER-7
                             ENDM
48A2           09480 ZERO    DW2    DOCON,0
48A2 6648                    DEFW   DOCON
48A4 0000                    DEFW   0
                             ENDM
               09490 ;
48A6           09500         DB     81H
48A6 81                      DEFB   81H
                             ENDM
48A7           09510         MB     1
48A7 B1                      DEFB   '1'+80H
                             ENDM
48A8           09520         DW     ZERO-4
48A8 9E48                    DEFW   ZERO-4
                             ENDM
48AA           09530 ONE     DW2    DOCON,1
48AA 6648                    DEFW   DOCON
48AC 0100                    DEFW   1·
                             ENDM
               09540 ;
48AE           09550         DB     81H
48AE 81                      DEFB   81H
                             ENDM
48AF           09560         MB     2
48AF B2                      DEFB   '2'+80H
                             ENDM
48B0           09570         DW     ONE-4
48B0 A648                    DEFW   ONE-4
                             ENDM
48B2           09580 TWO     DW2    DOCON,2
48B2 6648                    DEFW   DOCON
48B4 0200                    DEFW   2
                             ENDM
               09590 ;
48B6           09600         DB     81H
48B6 81                      DEFB   81H
                             ENDM
48B7           09610         MB     3
48B7 B3                      DEFB   '3'+80H
                             ENDM
48B8           09620         DW     TWO-4
48B8 AE48                    DEFW   TWO-4
```

```
                                     ENDM
48BA              09630 THREE      DW2     DOCON,3
48BA 6648                          DEFW    DOCON
48BC 0300                          DEFW    3
                                   ENDM
                  09640 ;
48BE              09650            HD      2,B,L,THREE-4
48BE 82                            DEFB    2+80H
48BF 42                            DEFM    'B'
48C0 CC                            DEFB    'L'+80H
48C1 B648                          DEFW    THREE-4
                                   ENDM
48C3              09660 BL         DW2     DOCON,20H
48C3 6648                          DEFW    DOCON
48C5 2000                          DEFW    20H
                                   ENDM
                  09670 ;
48C7              09680            HD      3,C/,L,BL-5
48C7 83                            DEFB    3+80H
48C8 43                            DEFM    'C/'
48C9 2F
48CA CC                            DEFB    'L'+80H
48CB BE48                          DEFW    BL-5
                                   ENDM
48CD              09690 CSLL       DW2     DOCON,64
48CD 6648                          DEFW    DOCON
48CF 4000                          DEFW    64
                                   ENDM
                  09700 ;
48D1              09710            HD      5,FIRS,T,CSLL-6
48D1 85                            DEFB    5+80H
48D2 46                            DEFM    'FIRS'
48D3 49
48D4 52
48D5 53
48D6 D4                            DEFB    'T'+80H
48D7 C749                          DEFW    CSLL-6
                                   ENDM
48D9              09720 FIRST      DW2     DOCON,BUF1
48D9 6648                          DEFW    DOCON
48DB E473                          DEFW    BUF1
                                   ENDM
                  09730 ;
48DD              09740            HD      5,LIMI,T,FIRST-8
48DD 85                            DEFB    5+80H
48DE 4C                            DEFM    'LIMI'
48DF 49
48E0 4D
48E1 49
48E2 D4                            DEFB    'T'+80H
48E3 D148                          DEFW    FIRST-8
                                   ENDM
48E5              09750 LIMIT      DW2     DOCON,EM
48E5 6648                          DEFW    DOCON
48E7 F07F                          DEFW    EM
                                   ENDM
                  09760 ;
48E9              09770            HD      5,B/BU,F,LIMIT-8
```

```
48E9 85                         DEFB    5+80H
48EA 42                         DEFM    'B/BU'
48EB 2F
48EC 42
48ED 55
48EE C6                         DEFB    'F'+80H
48EF DD48                       DEFW    LIMIT-8
                                ENDM
48F1            09780 BBUF      DW2     DOCON,KBBUF
48F1 6648                       DEFW    DOCON
48F3 0004                       DEFW    KBBUF
                                ENDM
                09790 ;
48F5            09800           HD      5,B/SC,R,BBUF-8
48F5 85                         DEFB    5+80H
48F6 42                         DEFM    'B/SC'
48F7 2F
48F8 53
48F9 43
48FA D2                         DEFB    'R'+80H
48FB E948                       DEFW    BBUF-8
                                ENDM
48FD            09810 BSCR      DW2     DOCON,BSCRE
48FD 6648                       DEFW    DOCON
48FF 0100                       DEFW    BSCRE
                                ENDM
                09820 ;
4901            09830           HD      7,+ORIGI,N,BSCR-8
4901 87                         DEFB    7+80H
4902 2B                         DEFM    '+ORIGI'
4903 4F
4904 52
4905 49
4906 47
4907 49
4908 CE                         DEFB    'N'+80H
4909 F548                       DEFW    BSCR-8
                                ENDM
490B            09840 PORIG     DW5     DOCOL,LIT,ORIG,PLUS,SEMIS
490B 2448                       DEFW    DOCOL
490D 8D43                       DEFW    LIT
490F 5043                       DEFW    ORIG
4911 DC46                       DEFW    PLUS
4913 5B46                       DEFW    SEMIS
                                ENDM
                09850 ;
                09860 ; USER VARIABLES
                09870 ;
4915            09880           HD      2,S,0,PORIG-0AH
4915 82                         DEFB    2+80H
4916 53                         DEFM    'S'
4917 B0                         DEFB    '0'+80H
4918 0149                       DEFW    PORIG-0AH
                                ENDM
491A            09890 SZERO     DW2     DOUSE,6
491A 9248                       DEFW    DOUSE
491C 0600                       DEFW    6
                                ENDM
```

```
                        09900 ;
491E                    09910           HD      2,R,0,SZERO-5
491E 82                         DEFB    2+80H
491F 52                         DEFM    'R'
4920 B0                         DEFB    '0'+80H
4921 1549                       DEFW    SZERO-5
                                ENDM
4923                    09920 RZERO     DW2     DOUSE,8
4923 9248                       DEFW    DOUSE
4925 0800                       DEFW    8
                                ENDM
                        09930 ;
4927                    09940           HD      3,TI,B,RZERO-5
4927 83                         DEFB    3+80H
4928 54                         DEFM    'TI'
4929 49
492A C2                         DEFB    'B'+80H
492B 1E49                       DEFW    RZERO-5
                                ENDM
492D                    09950 TIB       DW      DOUSE
492D 9248                       DEFW    DOUSE
                                ENDM
492F                    09960           DB      0AH
492F 0A                         DEFB    0AH
                                ENDM
                        09970 ;
4930                    09980           HD      5,WIDT,H,TIB-6
4930 85                         DEFB    5+80H
4931 57                         DEFM    'WIDT'
4932 49
4933 44
4934 54
4935 C8                         DEFB    'H'+80H
4936 2749                       DEFW    TIB-6
                                ENDM
4938                    09990 WIDTH     DW      DOUSE
4938 9248                       DEFW    DOUSE
                                ENDM
493A                    10000           DB      0CH
493A 0C                         DEFB    0CH
                                ENDM
                        10010 ;
493B                    10020           HD      7,WARNIN,G,WIDTH-8
493B 87                         DEFB    7+80H
493C 57                         DEFM    'WARNIN'
493D 41
493E 52
493F 4E
4940 49
4941 4E
4942 C7                         DEFB    'G'+80H
4943 3049                       DEFW    WIDTH-8
                                ENDM
4945                    10030 WARN      DW      DOUSE
4945 9248                       DEFW    DOUSE
                                ENDM
4947                    10040           DB      0EH
4947 0E                         DEFB    0EH
```

```
                              ENDM
                 10050  ;
4948             10060          HD        5,FENC,E,WARN-0AH
4948  85                        DEFB      5+80H
4949  46                        DEFM      'FENC'
494A  45
494B  4E
494C  43
494D  C5                        DEFB      'E'+80H
494E  3B49                      DEFW      WARN-0AH
                                ENDM
4950             10070  FENCE   DW        DOUSE
4950  9248                      DEFW      DOUSE
                                ENDM
4952             10080          DB        10H
4952  10                        DEFB      10H
                                ENDM
                 10090  ;
4953             10100          HD        2,D,P,FENCE-8
4953  82                        DEFB      2+80H
4954  44                        DEFM      'D'
4955  D0                        DEFB      'P'+80H
4956  4849                      DEFW      FENCE-8
                                ENDM
4958             10110  DP      DW        DOUSE
4958  9248                      DEFW      DOUSE
                                ENDM
495A             10120          DB        12H
495A  12                        DEFB      12H
                                ENDM
                 10130  ;
495B             10140          HD        8,VOC-LIN,K,DP-5
495B  88                        DEFB      8+80H
495C  56                        DEFM      'VOC-LIN'
495D  4F
495E  43
495F  2D
4960  4C
4961  49
4962  4E
4963  CB                        DEFB      'K'+80H
4964  5349                      DEFW      DP-5
                                ENDM
4966             10150  VOCL    DW2       DOUSE,14H
4966  9248                      DEFW      DOUSE
4968  1400                      DEFW      14H
                                ENDM
                 10160  ;
496A             10170          HD        3,BL,K,VOCL-0BH
496A  83                        DEFB      3+80H
496B  42                        DEFM      'BL'
496C  4C
496D  CB                        DEFB      'K'+80H
496E  5B49                      DEFW      VOCL-0BH
                                ENDM
4970             10180  BLK     DW        DOUSE
4970  9248                      DEFW      DOUSE
                                ENDM
```

```
4972              10190           DB      16H
4972 16                           DEFB    16H
                                  ENDM
                  10200  ;
4973              10210           HD      2,I,N,BLK-6
4973 82                           DEFB    2+80H
4974 49                           DEFM    'I'
4975 CE                           DEFB    'N'+80H
4976 6A49                         DEFW    BLK-6
                                  ENDM
4978              10220 INN       DW      DOUSE
4978 9248                         DEFW    DOUSE
                                  ENDM
497A              10230           DB      18H
497A 18                           DEFB    18H
                                  ENDM
                  10240  ;
497B              10250           HD      3,OU,T,INN-5
497B 83                           DEFB    3+80H
497C 4F                           DEFM    'OU'
497D 55
497E D4                           DEFB    'T'+80H
497F 7349                         DEFW    INN-5
                                  ENDM
4981              10260 OUTT      DW      DOUSE
4981 9248                         DEFW    DOUSE
                                  ENDM
4983              10270           DB      1AH
4983 1A                           DEFB    1AH
                                  ENDM
                  10280  ;
4984              10290           HD      3,SC,R,OUTT-6
4984 83                           DEFB    3+80H
4985 53                           DEFM    'SC'
4986 43
4987 D2                           DEFB    'R'+80H
4988 7B49                         DEFW    OUTT-6
                                  ENDM
498A              10300 SCR       DW      DOUSE
498A 9248                         DEFW    DOUSE
                                  ENDM
498C              10310           DB      1CH
498C 1C                           DEFB    1CH
                                  ENDM
                  10320  ;
498D              10330           HD      6,OFFSE,T,SCR-6
498D 86                           DEFB    6+80H
498E 4F                           DEFM    'OFFSE'
498F 46
4990 46
4991 53
4992 45
4993 D4                           DEFB    'T'+80H
4994 8449                         DEFW    SCR-6
                                  ENDM
4996              10340 OFSET     DW      DOUSE
4996 9248                         DEFW    DOUSE
                                  ENDM
```

```
4998            10350       DB      01EH
4998 1E                     DEFB    01EH
                            ENDM
                10360 ;
4999            10370       HD      7,CONTEX,T,OFSET-9
4999 87                     DEFB    7+80H
499A 43                     DEFM    'CONTEX'
499B 4F
499C 4E
499D 54
499E 45
499F 58
49A0 D4                     DEFB    'T'+80H
49A1 8D49                   DEFW    OFSET-9
                            ENDM
49A3            10380 CONT  DW      DOUSE
49A3 9248                   DEFW    DOUSE
                            ENDM
49A5            10390       DB      20H
49A5 20                     DEFB    20H
                            ENDM
                10400 ;
49A6            10410       HD      7,CURREN,T,CONT-0AH
49A6 87                     DEFB    7+80H
49A7 43                     DEFM    'CURREN'
49A8 55
49A9 52
49AA 52
49AB 45
49AC 4E
49AD D4                     DEFB    'T'+80H
49AE 9949                   DEFW    CONT-0AH
                            ENDM
49B0            10420 CURR  DW      DOUSE
49B0 9248                   DEFW    DOUSE
                            ENDM
49B2            10430       DB      22H
49B2 22                     DEFB    22H
                            ENDM
                10440 ;
49B3            10450       HD      5,STAT,E,CURR-0AH
49B3 85                     DEFB    5+80H
49B4 53                     DEFM    'STAT'
49B5 54
49B6 41
49B7 54
49B8 C5                     DEFB    'E'+80H
49B9 A649                   DEFW    CURR-0AH
                            ENDM
49BB            10460 STATE DW      DOUSE
49BB 9248                   DEFW    DOUSE
                            ENDM
49BD            10470       DB      24H
49BD 24                     DEFB    24H
                            ENDM
                10480 ;
49BE            10490       HD      4,BAS,E,STATE-8
49BE 84                     DEFB    4+80H
```

```
49BF 42                         DEFM    'BAS'
49C0 41
49C1 53
49C2 C5                         DEFB    'E'+80H
49C3 B349                       DEFW    STATE-8
                                ENDM
49C5            10500 BASE      DW      DOUSE
49C5 9248                       DEFW    DOUSE
                                ENDM
49C7            10510           DB      26H
49C7 26                         DEFB    26H
                                ENDM
               10520 ;
49C8           10530           HD      3,DP,L,BASE-7
49C8 83                         DEFB    3+80H
49C9 44                         DEFM    'DP'
49CA 50
49CB CC                         DEFB    'L'+80H
49CC BE49                       DEFW    BASE-7
                                ENDM
49CE           10540 DPL        DW      DOUSE
49CE 9248                       DEFW    DOUSE
                                ENDM
49D0           10550           DB      28H
49D0 28                         DEFB    28H
                                ENDM
               10560 ;
49D1           10570           HD      3,FL,D,DPL-6
49D1 83                         DEFB    3+80H
49D2 46                         DEFM    'FL'
49D3 4C
49D4 C4                         DEFB    'D'+80H
49D5 C849                       DEFW    DPL-6
                                ENDM
49D7           10580 FLD        DW      DOUSE
49D7 9248                       DEFW    DOUSE
                                ENDM
49D9           10590           DB      2AH
49D9 2A                         DEFB    2AH
                                ENDM
               10600 ;
49DA           10610           HD      3,CS,P,FLD-6
49DA 83                         DEFB    3+80H
49DB 43                         DEFM    'CS'
49DC 53
49DD D0                         DEFB    'P'+80H
49DE D149                       DEFW    FLD-6
                                ENDM
49E0           10620 CSPP       DW      DOUSE
49E0 9248                       DEFW    DOUSE
                                ENDM
49E2           10630           DB      2CH
49E2 2C                         DEFB    2CH
                                ENDM
               10640 ;
49E3           10650           DB      82H
49E3 82                         DEFB    82H
                                ENDM
```

```
49E4            10660           DM      R
49E4 52                         DEFM    'R'
                                ENDM
49E5            10670           MB      #
49E5 A3                         DEFB    '#' +80H
                                ENDM
49E6            10680           DW      CSPP-6
49E6 DA49                       DEFW    CSPP-6
                                ENDM
49E8            10690 RNUM      DW      DOUSE
49E8 9248                       DEFW    DOUSE
                                ENDM
49EA            10700           DB      2EH
49EA 2E                         DEFB    2EH
                                ENDM
                10710 ;
49EB            10720           HD      3,HL,D,RNUM-5
49EB 83                         DEFB    3+80H
49EC 48                         DEFM    'HL'
49ED 4C
49EE C4                         DEFB    'D' +80H
49EF E349                       DEFW    RNUM-5
                                ENDM
49F1            10730 HLD       DW2     DOUSE,30H
49F1 9248                       DEFW    DOUSE
49F3 3000                       DEFW    30H
                                ENDM
                10740 ;
                10750 ; END OF USER VARIABLES
                10760 ;
49F5            10770           HD      2,1,+,HLD-6
49F5 82                         DEFB    2+80H
49F6 31                         DEFM    '1'
49F7 AB                         DEFB    '+' +80H
49F8 EB49                       DEFW    HLD-6
                                ENDM
49FA            10780 ONEP      DW4     DOCOL,ONE,PLUS,SEMIS
49FA 2448                       DEFW    DOCOL
49FC AA48                       DEFW    ONE
49FE DC46                       DEFW    PLUS
4A00 5B46                       DEFW    SEMIS
                                ENDM
                10790 ;
4A02            10800           HD      2,2,+,ONEP-5
4A02 82                         DEFB    2+80H
4A03 32                         DEFM    '2'
4A04 AB                         DEFB    '+' +80H
4A05 F549                       DEFW    ONEP-5
                                ENDM
4A07            10810 TWOP      DW4     DOCOL,TWO,PLUS,SEMIS
4A07 2448                       DEFW    DOCOL
4A09 B248                       DEFW    TWO
4A0B DC46                       DEFW    PLUS
4A0D 5B46                       DEFW    SEMIS
                                ENDM
                10820 ;
4A0F            10830           HD      4,HER,E,TWOP-5
4A0F 84                         DEFB    4+80H
```

```
4A10 48                          DEFM    'HER'
4A11 45
4A12 52
4A13 C5                          DEFB    'E'+80H
4A14 024A                        DEFW    TWOP-5
                                 ENDM
4A16        10840 HERE           DW4     DOCOL,DP,AT,SEMIS
4A16 2448                        DEFW    DOCOL
4A18 5849                        DEFW    DP
4A1A AA47                        DEFW    AT
4A1C 5B46                        DEFW    SEMIS
                                 ENDM
            10850 ;
4A1E        10860                HD      5,ALLO,T,HERE-7
4A1E 85                          DEFB    5+80H
4A1F 41                          DEFM    'ALLO'
4A20 4C
4A21 4C
4A22 4F
4A23 D4                          DEFB    'T'+80H
4A24 0F4A                        DEFW    HERE-7
                                 ENDM
4A26        10870 ALLOT          DW4     DOCOL,DP,PSTOR,SEMIS
4A26 2448                        DEFW    DOCOL
4A28 5849                        DEFW    DP
4A2A 8547                        DEFW    PSTOR
4A2C 5B46                        DEFW    SEMIS
                                 ENDM
            10880 ;
4A2E        10890                DB      81H
4A2E 81                          DEFB    81H
                                 ENDM
4A2F AC     10900                DEFB    ','+80H
4A30        10910                DW      ALLOT-8
4A30 1E4A                        DEFW    ALLOT-8
                                 ENDM
4A32        10920 COMMA          DW6     DOCOL,HERE,STORE,TWO,ALLOT,SEMIS
4A32 2448                        DEFW    DOCOL
4A34 164A                        DEFW    HERE
4A36 E147                        DEFW    STORE
4A38 B248                        DEFW    TWO
4A3A 264A                        DEFW    ALLOT
4A3C 5B46                        DEFW    SEMIS
                                 ENDM
            10930 ;
4A3E        10940                DB      82H
4A3E 82                          DEFB    82H
                                 ENDM
4A3F        10950                DM      C
4A3F 43                          DEFM    'C'
                                 ENDM
4A40 AC     10960                DEFB    ','+80H
4A41        10970                DW      COMMA-4
4A41 2E4A                        DEFW    COMMA-4
                                 ENDM
4A43        10980 CCOMM          DW6     DOCOL,HERE,CSTOR,ONE,ALLOT,SEMIS
4A43 2448                        DEFW    DOCOL
4A45 164A                        DEFW    HERE
```

```
4A47 F047                        DEFW      CSTOR
4A49 AA48                        DEFW      ONE
4A4B 264A                        DEFW      ALLOT
4A4D 5B46                        DEFW      SEMIS
                                 ENDM
                 10990 ;
                 11000 ; SUBROUTINE USED BY - AND <
                 11010 ;        (HL) <- (HL) - (DE)
                 11020 ;
                 11030 ;
4A4F 7D          11040 SSUB      LD        A,L      ; LB
4A50 93          11050           SUB       E
4A51 6F          11060           LD        L,A
4A52 7C          11070           LD        A,H      ; HB
4A53 9A          11080           SBC       A,D
4A54 67          11090           LD        H,A
4A55 C9          11100           RET
                 11110 ;
4A56             11120           DB        81H
4A56 81                          DEFB      81H
                                 ENDM
4A57             11130           MB        -
4A57 AD                          DEFB      '-'+80H
                                 ENDM
4A58             11140           DW        CCOMM-5
4A58 3E4A                        DEFW      CCOMM-5
                                 ENDM
4A5A             11150 SUBB      DW        $+2
4A5A 5C4A                        DEFW      $+2
                                 ENDM
4A5C D1          11160           POP       DE
4A5D E1          11170           POP       HL
4A5E CD4F4A      11180           CALL      SSUB
4A61 C37B43      11190           JP        HPUSH
                 11200 ;
4A64             11210           DB        81H
4A64 81                          DEFB      81H
                                 ENDM
4A65             11220           MB        =
4A65 BD                          DEFB      '='+80H
                                 ENDM
4A66             11230           DW        SUBB-4
4A66 564A                        DEFW      SUBB-4
                                 ENDM
4A68             11240 EQUAL     DW4       DOCOL,SUBB,ZEQU,SEMIS
4A68 2448                        DEFW      DOCOL
4A6A 5A4A                        DEFW      SUBB
4A6C B746                        DEFW      ZEQU
4A6E 5B46                        DEFW      SEMIS
                                 ENDM
                 11250 ;
4A70             11260           DB        81H
4A70 81                          DEFB      81H
                                 ENDM
4A71             11270           MB        <                        ; X  <  Y
4A71 BC                          DEFB      '<'+80H
                                 ENDM
4A72             11280           DW        EQUAL-4        ; S2        S1
```

```
4A72  644A                    DEFW      EQUAL-4
                              ENDM
4A74          11290 LESS      DW        $+2
4A74  764A                    DEFW      $+2
                              ENDM
4A76  D1      11300           POP       DE        ; (DE) <- (S1) = Y
4A77  E1      11310           POP       HL        ; (HL) <- (S2) = X
4A78  7A      11320           LD        A,D       ; IF X&Y HAVE SAME SIGNS
4A79  AC      11330           XOR       H
4A7A  FA804A  11340           JP        M,LES1
4A7D  CD4F4A  11350           CALL      SSUB      ; (HL) <-  X-Y
4A80  24      11360 LES1      INC       H         ; IF (HL) >= 0
4A81  25      11370           DEC       H
4A82  FA8B4A  11380           JP        M,LES2
4A85  210000  11390           LD        HL,0      ; THEN X >= Y
4A88  C37B43  11400           JP        HPUSH     ; (S1) <- FALSE
4A8B  210100  11410 LES2      LD        HL,1      ; ELSE X < Y
4A8E  C37B43  11420           JP        HPUSH     ; (SI) <- TRUE
              11430 ;
4A91          11440           HD        2,U,<,LESS-4
4A91  82                      DEFB      2+80H
4A92  55                      DEFM      'U'
4A93  BC                      DEFB      '<'+80H
4A94  704A                    DEFW      LESS-4
                              ENDM
4A96          11450 ULESS     DW5       DOCOL,TDUP,XORR,ZLESS,ZBRAN
4A96  2448                    DEFW      DOCOL
4A98  7747                    DEFW      TDUP
4A9A  FC45                    DEFW      XORR
4A9C  CA46                    DEFW      ZLESS
4A9E  C643                    DEFW      ZBRAN
                              ENDM
4AA0          11460           DW6       ULES1-$,DROP,ZLESS,ZEQU,BRAN,ULES2-$
4AA0  0C00                    DEFW      ULES1-$
4AA2  4F47                    DEFW      DROP
4AA4  CA46                    DEFW      ZLESS
4AA6  B746                    DEFW      ZEQU
4AA8  AF43                    DEFW      BRAN
4AAA  0600                    DEFW      ULES2-$
                              ENDM
4AAC          11470 ULES1     DW2       SUBB,ZLESS
4AAC  5A4A                    DEFW      SUBB
4AAE  CA46                    DEFW      ZLESS
                              ENDM
4AB0          11480 ULES2     DW        SEMIS
4AB0  5B46                    DEFW      SEMIS
                              ENDM
              11490 ;
4AB2          11500           DB        81H
4AB2  81                      DEFB      81H
                              ENDM
4AB3          11510           MB        >
4AB3  BE                      DEFB      '>'+80H
                              ENDM
4AB4          11520           DW        ULESS-5
4AB4  914A                    DEFW      ULESS-5
                              ENDM
4AB6          11530 GREAT     DW4       DOCOL,SWAP,LESS,SEMIS
```

```
4AB6  2448                      DEFW    DOCOL
4AB8  5C47                      DEFW    SWAP
4ABA  744A                      DEFW    LESS
4ABC  5B46                      DEFW    SEMIS
                                ENDM
               11540  ;
4ABE           11550   HD       3,RO,T,GREAT-4
4ABE  83                        DEFB    3+80H
4ABF  52                        DEFM    'RO'
4AC0  4F
4AC1  D4                        DEFB    'T'+80H
4AC2  B24A                      DEFW    GREAT-4
                                ENDM
4AC4           11560  ROT       DW      $+2
4AC4  C64A                      DEFW    $+2
                                ENDM
4AC6  D1       11570            POP     DE
4AC7  E1       11580            POP     HL
4AC8·E3       11590            EX      (SP),HL
4AC9  C37A43   11600            JP      DPUSH
               11610  ;
4ACC           11620   HD       5,SPAC,E,ROT-6
4ACC  85                        DEFB    5+80H
4ACD  53                        DEFM    'SPAC'
4ACE  50
4ACF  41
4AD0  43
4AD1  C5                        DEFB    'E'+80H
4AD2  BE4A                      DEFW    ROT-6
                                ENDM
4AD4           11630  SPACE     DW4     DOCOL,BL,EMIT,SEMIS
4AD4  2448                      DEFW    DOCOL
4AD6  C348                      DEFW    BL
4AD8  0745                      DEFW    EMIT
4ADA  5B46                      DEFW    SEMIS
                                ENDM
               11640  ;
4ADC           11650   HD       4,-DU,P,SPACE-8
4ADC  84                        DEFB    4+80H
4ADD  2D                        DEFM    '-DU'
4ADE  44
4ADF  55
4AE0  D0                        DEFB    'P'+80H
4AE1  CC4A                      DEFW    SPACE-8
                                ENDM
4AE3           11660  DDUP      DW5     DOCOL,DUP,ZBRAN,DDUP1-$,DUP
4AE3  2448                      DEFW    DOCOL
4AE5  6947                      DEFW    DUP
4AE7  C643                      DEFW    ZBRAN
4AE9  0400                      DEFW    DDUP1-$
4AEB  6947                      DEFW    DUP
                                ENDM
4AED           11670  DDUP1     DW      SEMIS
4AED  5B46                      DEFW    SEMIS
                                ENDM
               11680  ;
4AEF           11690   HD       8,TRAVERS,E,DDUP-7
4AEF  88                        DEFB    8+80H
```

```
4AF0 54                         DEFM    ' TRAVERS'
4AF1 52
4AF2 41
4AF3 56
4AF4 45
4AF5 52
4AF6 53
4AF7 C5                         DEFB    'E' +80H
4AF8 DC4A                       DEFW    DDUP-7
                                ENDM
4AFA            11700 TRAV      DW2     DOCOL,SWAP
4AFA 2448                       DEFW    DOCOL
4AFC 5C47                       DEFW    SWAP
                                ENDM
4AFE            11710 TRAV1     DW6     OVER,PLUS,LIT,07FH,OVER.CAT
4AFE 4047                       DEFW    OVER
4B00 DC46                       DEFW    PLUS
4B02 8D43                       DEFW    LIT
4B04 7F00                       DEFW    07FH
4B06 4047                       DEFW    OVER
4B08 B947                       DEFW    CAT
                                ENDM
4B0A            11720           DW6     LESS,ZBRAN,TRAV1-$,SWAP,DROP.SEMIS
4B0A 744A                       DEFW    LESS
4B0C C643                       DEFW    ZBRAN
4B0E F0FF                       DEFW    TRAV1-$
4B10 5C47                       DEFW    SWAP
4B12 4F47                       DEFW    DROP
4B14 5B46                       DEFW    SEMIS
                                ENDM
                11730 ;
4B16            11740           HD      6,LATES,T,TRAV-0BH
4B16 86                         DEFB    6+80H
4B17 4C                         DEFM    'LATES'
4B18 41
4B19 54
4B1A 45
4B1B 53
4B1C D4                         DEFB    'T' +80H
4B1D EF4A                       DEFW    TRAV-0BH
                                ENDM
4B1F            11750 LATES     DW5     DOCOL,CURR,AT,AT,SEMIS
4B1F 2448                       DEFW    DOCOL
4B21 B049                       DEFW    CURR
4B23 AA47                       DEFW    AT
4B25 AA47                       DEFW    AT
4B27 5B46                       DEFW    SEMIS
                                ENDM
                11760 ;
4B29            11770           HD      3,LF,A,LATES-9
4B29 83                         DEFB    3+80H
4B2A 4C                         DEFM    'LF'
4B2B 46
4B2C C1                         DEFB    'A' +80H
4B2D 164B                       DEFW    LATES-9
                                ENDM
4B2F            11780 LFA       DW5     DOCOL,LIT,4,SUBB,SEMIS
4B2F 2448                       DEFW    DOCOL
```

```
4B31 8D43                          DEFW      LIT
4B33 0400                          DEFW      4
4B35 5A4A                          DEFW      SUBB
4B37 5B46                          DEFW      SEMIS
                                   ENDM
                11790 ;
4B39            11800     HD        3,CF,A,LFA-6
4B39 83                            DEFB      3+80H
4B3A 43                            DEFM      'CF'
4B3B 46
4B3C C1                            DEFB      'A'+80H
4B3D 294B                          DEFW      LFA-6
                                   ENDM
4B3F            11810 CFA DW4       DOCOL,TWO,SUBB,SEMIS
4B3F 2448                          DEFW      DOCOL
4B41 B248                          DEFW      TWO
4B43 5A4A                          DEFW      SUBB
4B45 5B46                          DEFW      SEMIS
                                   ENDM
                11820 ;
4B47            11830     HD        3,NF,A,CFA-6
4B47 83                            DEFB      3+80H
4B48 4E                            DEFM      'NF'
4B49 46                                                .
4B4A C1                            DEFB      'A'+80H
4B4B 394B                          DEFW      CFA-6
                                   ENDM
4B4D            11840 NFA DW8       DOCOL,LIT,5,SUBB,LIT,-1,TRAV.SEMIS
4B4D 2448                          DEFW      DOCOL
4B4F 8D43                          DEFW      LIT
4B51 0500                          DEFW      5
4B53 5A4A                          DEFW      SUBB
4B55 8D43                          DEFW      LIT
4B57 FFFF                          DEFW      -1
4B59 FA4A                          DEFW      TRAV
4B5B 5B46                          DEFW      SEMIS
                                   ENDM
                11850 ;
4B5D            11860     HD        3,PF,A,NFA-6
4B5D 83                            DEFB      3+80H
4B5E 50                            DEFM      'PF'
4B5F 46
4B60 C1                            DEFB      'A'+80H
4B61 474B                          DEFW      NFA-6
                                   ENDM
4B63            11870 PFA DW7       DOCOL,ONE,TRAV,LIT,5,PLUS,SEMIS
4B63 2448                          DEFW      DOCOL
4B65 AA48                          DEFW      ONE
4B67 FA4A                          DEFW      TRAV
4B69 8D43                          DEFW      LIT
4B6B 0500                          DEFW      5
4B6D DC46                          DEFW      PLUS
4B6F 5B46                          DEFW      SEMIS
                                   ENDM
                11880 ;
4B71            11890     HD        4,!CS,P,PFA-6
4B71 84                            DEFB      4+80H
4B72 21                            DEFM      '!CS'
```

```
4B73  43
4B74  53
4B75  D0                              DEFB    'P'+80H
4B76  5D4B                            DEFW    PFA-6
                                      ENDM
4B78              11900 SCSP          DW5     DOCOL,SPAT,CSPP,STORE,SEMIS
4B78  2448                            DEFW    DOCOL
4B7A  0F46                            DEFW    SPAT
4B7C  E049                            DEFW    CSPP
4B7E  E147                            DEFW    STORE
4B80  5B46                            DEFW    SEMIS
                                      ENDM
                  11910 ;
4B82              11920               HD      6,?ERRO,R,SCSP-7
4B82  86                              DEFB    6+80H
4B83  3F                              DEFM    ' ?ERRO'
4B84  45
4B85  52
4B86  52
4B87  4F
4B88  D2                              DEFB    'R'+80H
4B89  714B                            DEFW    SCSP-7
                                      ENDM
4B8B              11930 QERR          DW7     DOCOL,SWAP,ZBRAN,QERR1-$,ERROR,BRAN.QERR2-$
4B8B  2448                            DEFW    DOCOL
4B8D  5C47                            DEFW    SWAP
4B8F  C643                            DEFW    ZBRAN
4B91  0800                            DEFW    QERR1-$
4B93  2450                            DEFW    ERROR
4B95  AF43                            DEFW    BRAN
4B97  0400                            DEFW    QERR2-$
                                      ENDM
4B99              11940 QERR1         DW      DROP
4B99  4F47                            DEFW    DROP
                                      ENDM
4B9B              11950 QERR2         DW      SEMIS
4B9B  5B46                            DEFW    SEMIS
                                      ENDM
                  11960 ;
4B9D              11970               HD      5,?COM,P,QERR-9
4B9D  85                              DEFB    5+80H
4B9E  3F                              DEFM    ' ?COM'
4B9F  43
4BA0  4F
4BA1  4D
4BA2  D0                              DEFB    'P'+80H
4BA3  824B                            DEFW    QERR-9
                                      ENDM
4BA5              11980 QCOMP         DW8     DOCOL,STATE,AT,ZEQU,LIT,11H,QERR.SEMIS
4BA5  2448                            DEFW    DOCOL
4BA7  BB49                            DEFW    STATE
4BA9  AA47                            DEFW    AT
4BAB  B746                            DEFW    ZEQU
4BAD  8D43                            DEFW    LIT
4BAF  1100                            DEFW    11H
4BB1  8B4B                            DEFW    QERR
4BB3  5B46                            DEFW    SEMIS
                                      ENDM
```

```
                        11990 ;
4BB5                    12000           HD       5,?EXE,C,QCOMP-8
4BB5 85                                 DEFB     5+80H
4BB6 3F                                 DEFM     '?EXE'
4BB7 45
4BB8 58
4BB9 45
4BBA C3                                 DEFB     'C'+80H
4BBB 9D4B                               DEFW     QCOMP-8
                                        ENDM
4BBD                    12010 QEXEC     DW7      DOCOL,STATE,AT,LIT,12H,QERR,SEMIS
4BBD 2448                               DEFW     DOCOL
4BBF BB49                               DEFW     STATE
4BC1 AA47                               DEFW     AT
4BC3 8D43                               DEFW     LIT
4BC5 1200                               DEFW     12H
4BC7 8B4B                               DEFW     QERR
4BC9 5B46                               DEFW     SEMIS
                                        ENDM
                        12020 ;
4BCB                    12030           HD       6,?PAIR,S,QEXEC-8
4BCB 86                                 DEFB     6+80H
4BCC 3F                                 DEFM     '?PAIR'
4BCD 50
4BCE 41
4BCF 49
4BD0 52
4BD1 D3                                 DEFB     'S'+80H
4BD2 B54B                               DEFW     QEXEC-8
                                        ENDM
4BD4                    12040 QPAIR     DW6      DOCOL,SUBB,LIT,13H,QERR,SEMIS
4BD4 2448                               DEFW     DOCOL
4BD6 5A4A                               DEFW     SUBB
4BD8 8D43                               DEFW     LIT
4BDA 1300                               DEFW     13H
4BDC 8B4B                               DEFW     QERR
4BDE 5B46                               DEFW     SEMIS
                                        ENDM
                        12050 ;
4BE0                    12060           HD       4,?CS,P,QPAIR-9
4BE0 84                                 DEFB     4+80H
4BE1 3F                                 DEFM     '?CS'
4BE2 43
4BE3 53
4BE4 D0                                 DEFB     'P'+80H
4BE5 CB4B                               DEFW     QPAIR-9
                                        ENDM
4BE7                    12070 QCSP      DW5      DOCOL,SPAT,CSPP,AT,SUBB
4BE7 2448                               DEFW     DOCOL
4BE9 0F46                               DEFW     SPAT
4BEB E049                               DEFW     CSPP
4BED AA47                               DEFW     AT
4BEF 5A4A                               DEFW     SUBB
                                        ENDM
4BF1                    12080           DW4      LIT,14H,QERR,SEMIS
4BF1 8D43                               DEFW     LIT
4BF3 1400                               DEFW     14H
4BF5 8B4B                               DEFW     QERR
```

```
4BF7  5B46                      DEFW    SEMIS
                                ENDM
                  12090 ;
4BF9              12100         HD      8,?LOADIN,G,QCSP-7
4BF9  88                        DEFB    8+80H
4BFA  3F                        DEFM    '?LOADIN'
4BFB  4C
4BFC  4F
4BFD  41
4BFE  44
4BFF  49
4C00  4E
4C01  C7                        DEFB    'G'+80H
4C02  E04B                      DEFW    QCSP-7
                                ENDM
4C04              12110 QLOAD   DW8     DOCOL,BLK,AT,ZEQU,LIT,16H.QERR.SEMIS
4C04  2448                      DEFW    DOCOL
4C06  7049                      DEFW    BLK
4C08  AA47                      DEFW    AT
4C0A  B746                      DEFW    ZEQU
4C0C  8D43                      DEFW    LIT
4C0E  1600                      DEFW    16H
4C10  8B4B                      DEFW    QERR
4C12  5B46                      DEFW    SEMIS
                                ENDM
                  12120 ;
4C14              12130         HD      7,COMPIL,E,QLOAD-0BH
4C14  87                        DEFB    7+80H
4C15  43                        DEFM    'COMPIL'
4C16  4F
4C17  4D
4C18  50
4C19  49
4C1A  4C
4C1B  C5                        DEFB    'E'+80H
4C1C  F94B                      DEFW    QLOAD-0BH
                                ENDM
4C1E              12140 COMP    DW5     DOCOL,QCOMP,FROMR,DUP,TWOP
4C1E  2448                      DEFW    DOCOL
4C20  A54B                      DEFW    QCOMP
4C22  9C46                      DEFW    FROMR
4C24  6947                      DEFW    DUP
4C26  074A                      DEFW    TWOP
                                ENDM
4C28              12150         DW4     TOR,AT,COMMA,SEMIS
4C28  8646                      DEFW    TOR
4C2A  AA47                      DEFW    AT
4C2C  324A                      DEFW    COMMA
4C2E  5B46                      DEFW    SEMIS
                                ENDM
                  12160 ;
4C30              12170         DB      0C1H
4C30  C1                        DEFB    0C1H
                                ENDM
4C31              12180         DB      0DBH        ; LBRAC
4C31  DB                        DEFB    0DBH
                                ENDM
4C32              12190         DW      COMP-0AH
```

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4C32 144C                         DEFW    COMP-0AH
                          ENDM
4C34            12200 LBRAC  DW5    DOCOL,ZERO,STATE,STORE,SEMIS
4C34 2448                         DEFW    DOCOL
4C36 A248                         DEFW    ZERO
4C38 BB49                         DEFW    STATE
4C3A E147                         DEFW    STORE
4C3C 5B46                         DEFW    SEMIS
                          ENDM
                12210 ;
4C3E            12220        DB      81H
4C3E 81                           DEFB    81H
                          ENDM
4C3F            12230        DB      0DDH        ; RBRAC
4C3F DD                           DEFB    0DDH
                          ENDM
4C40            12240        DW      LBRAC-4
4C40 304C                         DEFW    LBRAC-4
                          ENDM
4C42            12250 RBRAC  DW6    DOCOL,LIT,0C0H,STATE,STORE.SEMIS
4C42 2448                         DEFW    DOCOL
4C44 8D43                         DEFW    LIT
4C46 C000                         DEFW    0C0H
4C48 BB49                         DEFW    STATE
4C4A E147                         DEFW    STORE
4C4C 5B46                         DEFW    SEMIS
                          ENDM
                12260 ;
4C4E            12270        HD      6,SMUDG,E,RBRAC-4
4C4E 86                           DEFB    6+80H
4C4F 53                           DEFM    ' SMUDG'
4C50 4D
4C51 55
4C52 44
4C53 47
4C54 C5                           DEFB    'E'+80H
4C55 3E4C                         DEFW    RBRAC-4
                          ENDM
4C57            12280 SMUDG  DW6    DOCOL,LATES,LIT,20H,TOGGL,SEMIS
4C57 2448                         DEFW    DOCOL
4C59 1F4B                         DEFW    LATES
4C5B 8D43                         DEFW    LIT
4C5D 2000                         DEFW    20H
4C5F 9C47                         DEFW    TOGGL
4C61 5B46                         DEFW    SEMIS
                          ENDM
                12290 ;
4C63            12300        HD      3,HE,X,SMUDG-9
4C63 83                           DEFB    3+80H
4C64 48                           DEFM    ' HE'
4C65 45
4C66 D8                           DEFB    'X'+80H
4C67 4E4C                         DEFW    SMUDG-9
                          ENDM
4C69            12310 HEX    DW6    DOCOL,LIT,10H,BASE,STORE,SEMIS
4C69 2448                         DEFW    DOCOL
4C6B 8D43                         DEFW    LIT
4C6D 1000                         DEFW    10H
```

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4C6F  C549                      DEFW    BASE
4C71  E147                      DEFW    STORE
4C73  5B46                      DEFW    SEMIS
                                ENDM
              12320 ;
4C75          12330     HD      7,DECIMA,L,HEX-6
4C75  87                        DEFB    7+80H
4C76  44                        DEFM    'DECIMA'
4C77  45
4C78  43
4C79  49
4C7A  4D
4C7B  41
4C7C  CC                        DEFB    'L'+80H
4C7D  634C                      DEFW    HEX-6
                                ENDM
4C7F          12340 DEC  DW6     DOCOL,LIT,0AH,BASE,STORE,SEMIS
4C7F  2448                      DEFW    DOCOL
4C81  8D43                      DEFW    LIT
4C83  0A00                      DEFW    0AH
4C85  C549                      DEFW    BASE
4C87  E147                      DEFW    STORE
4C89  5B46                      DEFW    SEMIS
                                ENDM
              12350 ;
4C8B          12360     DB      87H
4C8B  87                        DEFB    87H
                                ENDM
4C8C  28      12370             DEFM    '(;CODE'
4C8D  3B
4C8E  43
4C8F  4F
4C90  44
4C91  45
4C92          12380     MB      )
4C92  A9                        DEFB    ')'+80H
                                ENDM
4C93          12390     DW      DEC-0AH
4C93  754C                      DEFW    DEC-0AH
                                ENDM
4C95          12400 PSCOD DW7    DOCOL,FROMR,LATES,PFA,CFA,STORE,SEMIS
4C95  2448                      DEFW    DOCOL
4C97  9C46                      DEFW    FROMR
4C99  1F4B                      DEFW    LATES
4C9B  634B                      DEFW    PFA
4C9D  3F4B                      DEFW    CFA
4C9F  E147                      DEFW    STORE
4CA1  5B46                      DEFW    SEMIS
                                ENDM
              12410 ;
4CA3          12420     DB      0C5H
4CA3  C5                        DEFB    0C5H
                                ENDM
4CA4  3B      12430             DEFM    ';COD'
4CA5  43
4CA6  4F
4CA7  44
4CA8          12440     MB      E
```

```
4CA8  C5                              DEFB    'E'+80H
                          ENDM
4CA9              12450   DW      PSCOD-0AH
4CA9  8B4C                          DEFW    PSCOD-0AH
                          ENDM
4CAB              12460 SEMIC   DW5     DOCOL,QCSP,COMP,PSCOD,LBRAC
4CAB  2448                          DEFW    DOCOL
4CAD  E74B                          DEFW    QCSP
4CAF  1E4C                          DEFW    COMP
4CB1  954C                          DEFW    PSCOD
4CB3  344C                          DEFW    LBRAC
                          ENDM
4CB5              12470 SEMI1   DW2     NOOP,SEMIS
4CB5  4D48                          DEFW    NOOP
4CB7  5B46                          DEFW    SEMIS
                          ENDM
                  12480 ;
4CB9              12490   HD      7,<BUILD,S,SEMIC-8
4CB9  87                            DEFB    7+80H
4CBA  3C                            DEFM    '<BUILD'
4CBB  42
4CBC  55
4CBD  49
4CBE  4C
4CBF  44
4CC0  D3                            DEFB    'S'+80H
4CC1  A34C                          DEFW    SEMIC-8
                          ENDM
4CC3              12500 BUILD   DW4     DOCOL,ZERO,CON,SEMIS
4CC3  2448                          DEFW    DOCOL
4CC5  A248                          DEFW    ZERO
4CC7  5C48                          DEFW    CON
4CC9  5B46                          DEFW    SEMIS
                          ENDM
                  12510 ;
4CCB              12520   HD      5,DOES,>,BUILD-0AH
4CCB  85                            DEFB    5+80H
4CCC  44                            DEFM    'DOES'
4CCD  4F
4CCE  45
4CCF  53
4CD0  BE                            DEFB    '>'+80H
4CD1  B94C                          DEFW    BUILD-0AH
                          ENDM
4CD3              12530 DOES    DW6     DOCOL,FROMR,LATES,PFA,STORE,PSCOD
4CD3  2448                          DEFW    DOCOL
4CD5  9C46                          DEFW    FROMR
4CD7  1F4B                          DEFW    LATES
4CD9  634B                          DEFW    PFA
4CDB  E147                          DEFW    STORE
4CDD  954C                          DEFW    PSCOD
                          ENDM
4CDF  2A7843      12540 DODOE   LD      HL,(RPP)
4CE2  2B          12550   DEC     HL
4CE3  70          12560   LD      (HL),B
4CE4  2B          12570   DEC     HL
4CE5  71          12580   LD      (HL),C
4CE6  227843      12590   LD      (RPP),HL
```

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4CE9 13      12600       INC     DE
4CEA EB      12610       EX      DE,HL
4CEB 4E      12620       LD      C,(HL)
4CEC 23      12630       INC     HL
4CED 46      12640       LD      B,(HL)
4CEE 23      12650       INC     HL
4CEF C37B43  12660       JP      HPUSH
             12670 ;
4CF2         12680       HD      5,COUN,T,DOES-8
4CF2 85                  DEFB    5+80H
4CF3 43                  DEFM    'COUN'
4CF4 4F
4CF5 55
4CF6 4E
4CF7 D4                  DEFB    'T'+80H
4CF8 CB4C                DEFW    DOES-8
             ENDM
4CFA         12690 COUNT DW6     DOCOL,DUP,ONEP,SWAP,CAT,SEMIS
4CFA 2448                DEFW    DOCOL
4CFC 6947                DEFW    DUP
4CFE FA49                DEFW    ONEP
4D00 5C47                DEFW    SWAP
4D02 B947                DEFW    CAT
4D04 5B46                DEFW    SEMIS
             ENDM
             12700 ;
4D06         12710       HD      4,TYP,E,COUNT-8
4D06 84                  DEFB    4+80H
4D07 54                  DEFM    'TYP'
4D08 59
4D09 50
4D0A C5                  DEFB    'E'+80H
4D0B F24C                DEFW    COUNT-8
             ENDM
4D0D         12720 TYPE  DW8     DOCOL,DDUP,ZBRAN,TYPE1-$,OVER,PLUS,SWAP,XDO
4D0D 2448                DEFW    DOCOL
4D0F E34A                DEFW    DDUP
4D11 C643                DEFW    ZBRAN
4D13 1800                DEFW    TYPE1-$
4D15 4047                DEFW    OVER
4D17 DC46                DEFW    PLUS
4D19 5C47                DEFW    SWAP
4D1B 1F44                DEFW    XDO
             ENDM
4D1D         12730 TYPE2 DW7     IDO,CAT,EMIT,XLOOP,TYPE2-$,BRAN,TYPE3-$
4D1D 3B44                DEFW    IDO
4D1F B947                DEFW    CAT
4D21 0745                DEFW    EMIT
4D23 DA43                DEFW    XLOOP
4D25 F8FF                DEFW    TYPE2-$
4D27 AF43                DEFW    BRAN
4D29 0400                DEFW    TYPE3-$
             ENDM
4D2B         12740 TYPE1 DW      DROP
4D2B 4F47                DEFW    DROP
             ENDM
4D2D         12750 TYPE3 DW      SEMIS
4D2D 5B46                DEFW    SEMIS
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                            ENDM
                 12760  ;
4D2F             12770          HD       9,-TRAILIN,G,TYPE-7
4D2F  89                       DEFB     9+80H
4D30  2D                       DEFM     '-TRAILIN'
4D31  54
4D32  52
4D33  41
4D34  49
4D35  4C
4D36  49
4D37  4E
4D38  C7                       DEFB     'G'+80H
4D39  064D                     DEFW     TYPE-7
                               ENDM
4D3B             12780  DTRAI   DW4      DOCOL,DUP,ZERO,XDO
4D3B  2448                     DEFW     DOCOL
4D3D  6947                     DEFW     DUP
4D3F  A248                     DEFW     ZERO
4D41  1F44                     DEFW     XDO
                               ENDM
4D43             12790  DTRA1   DW8      OVER,OVER,PLUS,ONE,SUBB,CAT,BL.SUBB
4D43  4047                     DEFW     OVER
4D45  4047                     DEFW     OVER
4D47  DC46                     DEFW     PLUS
4D49  AA48                     DEFW     ONE
4D4B  5A4A                     DEFW     SUBB
4D4D  B947                     DEFW     CAT
4D4F  C348                     DEFW     BL
4D51  5A4A                     DEFW     SUBB
                               ENDM
4D53             12800          DW5      ZBRAN,DTRA2-$,LEAVE,BRAN,DTRA3-$
4D53  C643                     DEFW     ZBRAN
4D55  0800                     DEFW     DTRA2-$
4D57  7246                     DEFW     LEAVE
4D59  AF43                     DEFW     BRAN
4D5B  0600                     DEFW     DTRA3-$
                               ENDM
4D5D             12810  DTRA2   DW2      ONE,SUBB
4D5D  AA48                     DEFW     ONE
4D5F  5A4A                     DEFW     SUBB
                               ENDM
4D61             12820  DTRA3   DW3      XLOOP,DTRA1-$,SEMIS
4D61  DA43                     DEFW     XLOOP
4D63  E0FF                     DEFW     DTRA1-$
4D65  5B46                     DEFW     SEMIS
                               ENDM
                 12830  ;
4D67             12840          HD       4,(.",),DTRAI-0CH
4D67  84                       DEFB     4+80H
4D68  28                       DEFM     '(."'
4D69  2E
4D6A  22
4D6B  A9                       DEFB     ')'+80H
4D6C  2F4D                     DEFW     DTRAI-0CH
                               ENDM
4D6E             12850  PDOTQ   DW5      DOCOL,RR,COUNT,DUP,ONEP
4D6E  2448                     DEFW     DOCOL
```

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4D70 B046                    DEFW    RR
4D72 FA4C                    DEFW    COUNT
4D74 6947                    DEFW    DUP
4D76 FA49                    DEFW    ONEP
                             ENDM
4D78          12860          DW5     FROMR.PLUS,TOR,TYPE,SEMIS
4D78 9C46                    DEFW    FROMR
4D7A DC46                    DEFW    PLUS
4D7C 8646                    DEFW    TOR
4D7E 0D4D                    DEFW    TYPE
4D80 5B46                    DEFW    SEMIS
                             ENDM
              12870 ;
4D82          12880          HD      42H,.,',PDOTQ-7
4D82 C2                      DEFB    42H+80H
4D83 2E                      DEFM    '.'
4D84 A2                      DEFB    '"'+80H
4D85 674D                    DEFW    PDOTQ-7
                             ENDM
4D87          12890 DOTQ     DW8     DOCOL,LIT,22H,STATE,AT,ZBRAN,DOTQ1-$,COMP
4D87 2448                    DEFW    DOCOL
4D89 8D43                    DEFW    LIT
4D8B 2200                    DEFW    22H
4D8D BB49                    DEFW    STATE
4D8F AA47                    DEFW    AT
4D91 C643                    DEFW    ZBRAN
4D93 1400                    DEFW    DOTQ1-$
4D95 1E4C                    DEFW    COMP
                             ENDM
4D97          12900          DW8     PDOTQ,WORD,HERE,CAT,ONEP,ALLOT.BRAN.DOTQ2-$
4D97 6E4D                    DEFW    PDOTQ
4D99 F64E                    DEFW    WORD
4D9B 164A                    DEFW    HERE
4D9D B947                    DEFW    CAT
4D9F FA49                    DEFW    ONEP
4DA1 264A                    DEFW    ALLOT
4DA3 AF43                    DEFW    BRAN
4DA5 0A00                    DEFW    DOTQ2-$
                             ENDM
4DA7          12910 DOTQ1    DW4     WORD,HERE,COUNT,TYPE
4DA7 F64E                    DEFW    WORD
4DA9 164A                    DEFW    HERE
4DAB FA4C                    DEFW    COUNT
4DAD 0D4D                    DEFW    TYPE
                             ENDM
4DAF          12920 DOTQ2    DW      SEMIS
4DAF 5B46                    DEFW    SEMIS
                             ENDM
              12930 ;
4DB1          12940          HD      6,EXPEC,T,DOTQ-5
4DB1 86                      DEFB    6+80H
4DB2 45                      DEFM    'EXPEC'
4DB3 58
4DB4 50
4DB5 45
4DB6 43
4DB7 D4                      DEFB    'T'+80H
4DB8 824D                    DEFW    DOTQ-5
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                              ENDM
4DBA              12950 EXPEC  DW5    DOCOL,OVER,PLUS,OVER,XDO
4DBA  2448              DEFW   DOCOL
4DBC  4047              DEFW   OVER
4DBE  DC46              DEFW   PLUS
4DC0  4047              DEFW   OVER
4DC2  1F44              DEFW   XDO
                              ENDM
4DC4              12960 EXPE1  DW8    KEY,DUP,LIT,0EH,PORIG,AT,EQUAL,ZBRAN
4DC4  1945              DEFW   KEY
4DC6  6947              DEFW   DUP
4DC8  8D43              DEFW   LIT
4DCA  0E00              DEFW   0EH
4DCC  0B49              DEFW   PORIG
4DCE  AA47              DEFW   AT
4DD0  684A              DEFW   EQUAL
4DD2  C643              DEFW   ZBRAN
                              ENDM
4DD4              12970        DW8    EXPE2-$,DROP,DUP,IDO,EQUAL,DUP,FROMR,TWO
4DD4  2A00              DEFW   EXPE2-$
4DD6  4F47              DEFW   DROP
4DD8  6947              DEFW   DUP
4DDA  3B44              DEFW   IDO
4DDC  684A              DEFW   EQUAL
4DDE  6947              DEFW   DUP
4DE0  9C46              DEFW   FROMR
4DE2  B248              DEFW   TWO
                              ENDM
4DE4              12980        DW8    SUBB,PLUS,TOR,ZBRAN,EXPE6-$,LIT,BELL,BRAN
4DE4  5A4A              DEFW   SUBB
4DE6  DC46              DEFW   PLUS
4DE8  8646              DEFW   TOR
4DEA  C643              DEFW   ZBRAN
4DEC  0A00              DEFW   EXPE6-$
4DEE  8D43              DEFW   LIT
4DF0  0700              DEFW   BELL
4DF2  AF43              DEFW   BRAN
                              ENDM
4DF4              12990        DW     EXPE7-$
4DF4  0600              DEFW   EXPE7-$
                              ENDM
4DF6              13000 EXPE6  DW2    LIT,BSOUT
4DF6  8D43              DEFW   LIT
4DF8  0800              DEFW   BSOUT
                              ENDM
4DFA              13010 EXPE7  DW2    BRAN,EXPE3-$
4DFA  AF43              DEFW   BRAN
4DFC  2800              DEFW   EXPE3-$
                              ENDM
4DFE              13020 EXPE2  DW8    DUP,LIT,0DH,EQUAL,ZBRAN,EXPE4-$,LEAVE,DROP
4DFE  6947              DEFW   DUP
4E00  8D43              DEFW   LIT
4E02  0D00              DEFW   0DH
4E04  684A              DEFW   EQUAL
4E06  C643              DEFW   ZBRAN
4E08  0E00              DEFW   EXPE4-$
4E0A  7246              DEFW   LEAVE
4E0C  4F47              DEFW   DROP
```

```
                          ENDM
4E0E            13030     DW4      BL,ZERO,BRAN,EXPE5-$
4E0E C348                 DEFW     BL
4E10 A248                 DEFW     ZERO
4E12 AF43                 DEFW     BRAN
4E14 0400                 DEFW     EXPE5-$
                          ENDM
4E16            13040 EXPE4  DW    DUP
4E16 6947                 DEFW     DUP
                          ENDM
4E18            13050 EXPE5  DW6   IDO,CSTOR,ZERO,IDO,ONEP,STORE
4E18 3B44                 DEFW     IDO
4E1A F047                 DEFW     CSTOR
4E1C A248                 DEFW     ZERO
4E1E 3B44                 DEFW     IDO
4E20 FA49                 DEFW     ONEP
4E22 E147                 DEFW     STORE
                          ENDM
4E24            13060 EXPE3  DW5   EMIT,XLOOP,EXPE1-$,DROP,SEMIS
4E24 0745                 DEFW     EMIT
4E26 DA43                 DEFW     XLOOP
4E28 9CFF                 DEFW     EXPE1-$
4E2A 4F47                 DEFW     DROP
4E2C 5B46                 DEFW     SEMIS
                          ENDM
                13070 ;
4E2E            13080     HD       5,QUER,Y,EXPEC-9
4E2E 85                   DEFB     5+80H
4E2F 51                   DEFM     'QUER'
4E30 55
4E31 45
4E32 52
4E33 D9                   DEFB     'Y'+80H
4E34 B14D                 DEFW     EXPEC-9
                          ENDM
4E36            13090 QUERY  DW5   DOCOL,TIB,AT,LIT,50H
4E36 2448                 DEFW     DOCOL
4E38 2D49                 DEFW     TIB
4E3A AA47                 DEFW     AT
4E3C 8D43                 DEFW     LIT
4E3E 5000                 DEFW     50H
                          ENDM
4E40            13100     DW5      EXPEC,ZERO,INN,STORE,SEMIS
4E40 BA4D                 DEFW     EXPEC
4E42 A248                 DEFW     ZERO
4E44 7849                 DEFW     INN
4E46 E147                 DEFW     STORE
4E48 5B46                 DEFW     SEMIS
                          ENDM
                13110 ;
4E4A            13120     DB       0C1H
4E4A C1                   DEFB     0C1H
                          ENDM
4E4B            13130     DB       80H
4E4B 80                   DEFB     80H
                          ENDM
4E4C            13140     DW       QUERY-8
4E4C 2E4E                 DEFW     QUERY-8
```

```
                              ENDM
4E4E              13150 NULL  DW8     DOCOL,BLK,AT,ZBRAN,NULL1-$,ONE,BLK,PSTOR
4E4E  2448                    DEFW    DOCOL
4E50  7049                    DEFW    BLK
4E52  AA47                    DEFW    AT
4E54  C643                    DEFW    ZBRAN
4E56  2A00                    DEFW    NULL1-$
4E58  AA48                    DEFW    ONE
4E5A  7049                    DEFW    BLK
4E5C  8547                    DEFW    PSTOR
                              ENDM
4E5E              13160       DW8     ZERO,INN,STORE,BLK,AT,BSCR,ONE,SUBB
4E5E  A248                    DEFW    ZERO
4E60  7849                    DEFW    INN
4E62  E147                    DEFW    STORE
4E64  7049                    DEFW    BLK
4E66  AA47                    DEFW    AT
4E68  FD48                    DEFW    BSCR
4E6A  AA48                    DEFW    ONE
4E6C  5A4A                    DEFW    SUBB
                              ENDM
4E6E              13170       DW7     ANDD,ZEQU,ZBRAN,NULL2-$,QEXEC,FROMR,DROP
4E6E  D745                    DEFW    ANDD
4E70  B746                    DEFW    ZEQU
4E72  C643                    DEFW    ZBRAN
4E74  0800                    DEFW    NULL2-$
4E76  BD4B                    DEFW    QEXEC
4E78  9C46                    DEFW    FROMR
4E7A  4F47                    DEFW    DROP
                              ENDM
4E7C              13180 NULL2 DW2     BRAN,NULL3-$
4E7C  AF43                    DEFW    BRAN
4E7E  0600                    DEFW    NULL3-$
                              ENDM
4E80              13190 NULL1 DW2     FROMR,DROP
4E80  9C46                    DEFW    FROMR
4E82  4F47                    DEFW    DROP
                              ENDM
4E84              13200 NULL3 DW      SEMIS
4E84  5B46                    DEFW    SEMIS
                              ENDM
                  13210 ;
4E86              13220       HD      4,FIL,L,NULL-4
4E86  84                      DEFB    4+80H
4E87  46                      DEFM    'FIL'
4E88  49
4E89  4C
4E8A  CC                      DEFB    'L'+80H
4E8B  4A4E                    DEFW    NULL-4
                              ENDM
4E8D              13230 FILL  DW      $+2
4E8D  8F4E                    DEFW    $+2
                              ENDM
4E8F  69          13240       LD      L,C
4E90  60          13250       LD      H,B
4E91  D1          13260       POP     DE
4E92  C1          13270       POP     BC
4E93  E3          13280       EX      (SP),HL
```

```
4E94 EB          13290        EX      DE,HL
4E95 78          13300 FILL1  LD      A,B
4E96 B1          13310        OR      C
4E97 2806        13320        JR      Z,FILL2
4E99 7D          13330        LD      A,L
4E9A 12          13340        LD      (DE),A
4E9B 13          13350        INC     DE
4E9C 0B          13360        DEC     BC
4E9D 18F6        13370        JR      FILL1
4E9F C1          13380 FILL2  POP     BC
4EA0 C37C43      13390        JP      NEXT
                 13400 ;
4EA3             13410        HD      5,ERAS,E,FILL-7
4EA3 85                       DEFB    5+80H
4EA4 45                       DEFM    'ERAS'
4EA5 52
4EA6 41
4EA7 53
4EA8 C5                       DEFB    'E'+80H
4EA9 864E                     DEFW    FILL-7
                              ENDM
4EAB             13420 ERASEE DW4     DOCOL,ZERO,FILL,SEMIS
4EAB 2448                     DEFW    DOCOL
4EAD A248                     DEFW    ZERO
4EAF 8D4E                     DEFW    FILL
4EB1 5B46                     DEFW    SEMIS
                              ENDM
                 13430 ;
4EB3             13440        HD      6,BLANK,S,ERASEE-8
4EB3 86                       DEFB    6+80H
4EB4 42                       DEFM    'BLANK'
4EB5 4C
4EB6 41
4EB7 4E
4EB8 4B
4EB9 D3                       DEFB    'S'+80H
4EBA A34E                     DEFW    ERASEE-8
                              ENDM
4EBC             13450 BLANK  DW4     DOCOL,BL,FILL,SEMIS
4EBC 2448                     DEFW    DOCOL
4EBE C348                     DEFW    BL
4EC0 8D4E                     DEFW    FILL
4EC2 5B46                     DEFW    SEMIS
                              ENDM
                 13460 ;
4EC4             13470        HD      4,HOL,D,BLANK-9
4EC4 84                       DEFB    4+80H
4EC5 48                       DEFM    'HOL'
4EC6 4F
4EC7 4C
4EC8 C4                       DEFB    'D'+80H
4EC9 B34E                     DEFW    BLANK-9
                              ENDM
4ECB             13480 HOLD   DW8     DOCOL,LIT,-1,HLD,PSTOR,HLD,AT,CSTOR
4ECB 2448                     DEFW    DOCOL
4ECD 8D43                     DEFW    LIT
4ECF FFFF                     DEFW    -1
4ED1 F149                     DEFW    HLD
```

```
4ED3 8547                         DEFW    PSTOR
4ED5 F149                         DEFW    HLD
4ED7 AA47                         DEFW    AT
4ED9 F047                         DEFW    CSTOR
                                  ENDM
4EDB                13490         DW      SEMIS
4EDB 5B46                         DEFW    SEMIS
                                  ENDM
                    13500 ;
4EDD                13510         HD      3,PA,D,HOLD-7
4EDD 83                           DEFB    3+80H
4EDE 50                           DEFM    'PA'
4EDF 41
4EE0 C4                           DEFB    'D'+80H
4EE1 C44E                         DEFW    HOLD-7
                                  ENDM
4EE3                13520 PAD     DW6     DOCOL,HERE,LIT,44H,PLUS,SEMIS
4EE3 2448                         DEFW    DOCOL
4EE5 164A                         DEFW    HERE
4EE7 8D43                         DEFW    LIT
4EE9 4400                         DEFW    44H
4EEB DC46                         DEFW    PLUS
4EED 5B46                         DEFW    SEMIS
                                  ENDM
                    13530 ;
4EEF                13540         HD      4,WOR,D,PAD-6
4EEF 84                           DEFB    4+80H
4EF0 57                           DEFM    'WOR'
4EF1 4F
4EF2 52
4EF3 C4                           DEFB    'D'+80H
4EF4 DD4E                         DEFW    PAD-6
                                  ENDM
4EF6                13550 WORD    DW5     DOCOL,BLK,AT,ZBRAN,WORD1-$
4EF6 2448                         DEFW    DOCOL
4EF8 7049                         DEFW    BLK
4EFA AA47                         DEFW    AT
4EFC C643                         DEFW    ZBRAN
4EFE 0C00                         DEFW    WORD1-$
                                  ENDM
4F00                13560         DW5     BLK,AT,BLOCK,BRAN,WORD2-$
4F00 7049                         DEFW    BLK
4F02 AA47                         DEFW    AT
4F04 6256                         DEFW    BLOCK
4F06 AF43                         DEFW    BRAN
4F08 0600                         DEFW    WORD2-$
                                  ENDM
4F0A                13570 WORD1   DW2     TIB,AT
4F0A 2D49                         DEFW    TIB
4F0C AA47                         DEFW    AT
                                  ENDM
4F0E                13580 WORD2   DW8     INN,AT,PLUS,SWAP,ENCL,HERE,LIT,22H
4F0E 7849                         DEFW    INN
4F10 AA47                         DEFW    AT
4F12 DC46                         DEFW    PLUS
4F14 5C47                         DEFW    SWAP
4F16 C744                         DEFW    ENCL
4F18 164A                         DEFW    HERE
```

```
4F1A  8D43                    DEFW    LIT
4F1C  2200                    DEFW    22H
                             ENDM
4F1E         13590      DW8     BLANK,INN,PSTOR,OVER,SUBB.TOR,RR,HERE
4F1E  BC4E                    DEFW    BLANK
4F20  7849                    DEFW    INN
4F22  8547                    DEFW    PSTOR
4F24  4047                    DEFW    OVER
4F26  5A4A                    DEFW    SUBB
4F28  8646                    DEFW    TOR
4F2A  B046                    DEFW    RR
4F2C  164A                    DEFW    HERE
                             ENDM
4F2E         13600      DW7     CSTOR,PLUS,HERE,ONEP,FROMR.CMOVE,SEMIS
4F2E  F047                    DEFW    CSTOR
4F30  DC46                    DEFW    PLUS
4F32  164A                    DEFW    HERE
4F34  FA49                    DEFW    ONEP
4F36  9C46                    DEFW    FROMR
4F38  4445                    DEFW    CMOVE
4F3A  5B46                    DEFW    SEMIS
                             ENDM
             13610 ;
4F3C         13620      HD      8,(NUMBER,),WORD-7
4F3C  88                      DEFB    8+80H
4F3D  28                      DEFM    '(NUMBER'
4F3E  4E
4F3F  55
4F40  4D
4F41  42
4F42  45
4F43  52
4F44  A9                      DEFB    ')'+80H
4F45  EF4E                    DEFW    WORD-7
                             ENDM
4F47         13630 PNUMB DW      DOCOL
4F47  2448                    DEFW    DOCOL
                             ENDM
4F49         13640 PNUM1 DW8     ONEP,DUP,TOR,CAT,BASE,AT,DIGIT.ZBRAN
4F49  FA49                    DEFW    ONEP
4F4B  6947                    DEFW    DUP
4F4D  8646                    DEFW    TOR
4F4F  B947                    DEFW    CAT
4F51  C549                    DEFW    BASE
4F53  AA47                    DEFW    AT
4F55  4F44                    DEFW    DIGIT
4F57  C643                    DEFW    ZBRAN
                             ENDM
4F59         13650      DW8     PNUM2-$,SWAP,BASE,AT,USTAR,DROP,ROT,BASE
4F59  2C00                    DEFW    PNUM2-$
4F5B  5C47                    DEFW    SWAP
4F5D  C549                    DEFW    BASE
4F5F  AA47                    DEFW    AT
4F61  5645                    DEFW    USTAR
4F63  4F47                    DEFW    DROP
4F65  C44A                    DEFW    ROT
4F67  C549                    DEFW    BASE
                             ENDM
```

```
4F69              13660           DW8     AT,USTAR,DPLUS,DPL,AT,ONEP,ZBRAN,PNUM3-$
4F69 AA47                         DEFW    AT
4F6B 5645                         DEFW    USTAR
4F6D E946                         DEFW    DPLUS
4F6F CE49                         DEFW    DPL
4F71 AA47                         DEFW    AT
4F73 FA49                         DEFW    ONEP
4F75 C643                         DEFW    ZBRAN
4F77 0800                         DEFW    PNUM3-$
                                  ENDM
4F79              13670           DW3     ONE,DPL,PSTOR
4F79 AA48                         DEFW    ONE
4F7B CE49                         DEFW    DPL
4F7D 8547                         DEFW    PSTOR
                                  ENDM
4F7F              13680 PNUM3     DW3     FROMR,BRAN,PNUM1-$
4F7F 9C46                         DEFW    FROMR
4F81 AF43                         DEFW    BRAN
4F83 C6FF                         DEFW    PNUM1-$
                                  ENDM
4F85              13690 PNUM2     DW2     FROMR,SEMIS
4F85 9C46                         DEFW    FROMR
4F87 5B46                         DEFW    SEMIS
                                  ENDM
                  13700 ;
4F89              13710           HD      6,NUMBE,R,PNUMB-0BH
4F89 86                           DEFB    6+80H
4F8A 4E                           DEFM    'NUMBE'
4F8B 55
4F8C 4D
4F8D 42
4F8E 45
4F8F D2                           DEFB    'R'+80H
4F90 3C4F                         DEFW    PNUMB-0BH
                                  ENDM
4F92              13720 NUMB      DW8     DOCOL,ZERO,ZERO,ROT,DUP,ONEP.CAT.LIT
4F92 2448                         DEFW    DOCOL
4F94 A248                         DEFW    ZERO
4F96 A248                         DEFW    ZERO
4F98 C44A                         DEFW    ROT
4F9A 6947                         DEFW    DUP
4F9C FA49                         DEFW    ONEP
4F9E B947                         DEFW    CAT
4FA0 8D43                         DEFW    LIT
                                  ENDM
4FA2              13730           DW7     2DH,EQUAL,DUP,TOR,PLUS,LIT,-1
4FA2 2D00                         DEFW    2DH
4FA4 684A                         DEFW    EQUAL
4FA6 6947                         DEFW    DUP
4FA8 8646                         DEFW    TOR
4FAA DC46                         DEFW    PLUS
4FAC 8D43                         DEFW    LIT
4FAE FFFF                         DEFW    -1
                                  ENDM
4FB0              13740 NUMB1     DW8     DPL,STORE,PNUMB,DUP,CAT,BL.SUBB.ZBRAN
4FB0 CE49                         DEFW    DPL
4FB2 E147                         DEFW    STORE
4FB4 474F                         DEFW    PNUMB
```

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4FB6  6947                        DEFW    DUP
4FB8  B947                        DEFW    CAT
4FBA  C348                        DEFW    BL
4FBC  5A4A                        DEFW    SUBB
4FBE  C643                        DEFW    ZBRAN
                                  ENDM
4FC0           13750    DW8       NUMB2-$,DUP,CAT,LIT,2EH,SUBB,ZERO,QERR
4FC0  1600                        DEFW    NUMB2-$
4FC2  6947                        DEFW    DUP
4FC4  B947                        DEFW    CAT
4FC6  8D43                        DEFW    LIT
4FC8  2E00                        DEFW    2EH
4FCA  5A4A                        DEFW    SUBB
4FCC  A248                        DEFW    ZERO
4FCE  8B4B                        DEFW    QERR
                                  ENDM
4FD0           13760    DW3       ZERO,BRAN,NUMB1-$
4FD0  A248                        DEFW    ZERO
4FD2  AF43                        DEFW    BRAN
4FD4  DCFF                        DEFW    NUMB1-$
                                  ENDM
4FD6           13770 NUMB2  DW5   DROP,FROMR,ZBRAN,NUMB3-$,DMINU
4FD6  4F47                        DEFW    DROP
4FD8  9C46                        DEFW    FROMR
4FDA  C643                        DEFW    ZBRAN
4FDC  0400                        DEFW    NUMB3-$
4FDE  2247                        DEFW    DMINU
                                  ENDM
4FE0           13780 NUMB3  DW    SEMIS
4FE0  5B46                        DEFW    SEMIS
                                  ENDM
               13790 ;
4FE2           13800    HD        5,-FIN,D,NUMB-9
4FE2  85                          DEFB    5+80H
4FE3  2D                          DEFM    '-FIN'
4FE4  46
4FE5  49
4FE6  4E
4FE7  C4                          DEFB    'D'+80H
4FE8  894F                        DEFW    NUMB-9
                                  ENDM
4FEA           13810 DFIND  DW8   DOCOL,BL,WORD,HERE,CONT,AT,AT,PFIND
4FEA  2448                        DEFW    DOCOL
4FEC  C348                        DEFW    BL
4FEE  F64E                        DEFW    WORD
4FF0  164A                        DEFW    HERE
4FF2  A349                        DEFW    CONT
4FF4  AA47                        DEFW    AT
4FF6  AA47                        DEFW    AT
4FF8  7D44                        DEFW    PFIND
                                  ENDM
4FFA           13820    DW8       DUP,ZEQU,ZBRAN,DFIN1-$,DROP,HERE,LATES,PFIND

4FFA  6947                        DEFW    DUP
4FFC  B746                        DEFW    ZEQU
4FFE  C643                        DEFW    ZBRAN
5000  0A00                        DEFW    DFIN1-$
5002  4F47                        DEFW    DROP
```

```
5004  164A                       DEFW    HERE
5006  1F4B                       DEFW    LATES
5008  7D44                       DEFW    PFIND
                                 ENDM
500A            13830 DFIN1      DW      SEMIS
500A  5B46                       DEFW    SEMIS
                                 ENDM
                13840 ;
500C            13850            HD      7,(ABORT,),DFIND-8
500C  87                         DEFB    7+80H
500D  28                         DEFM    '(ABORT'
500E  41
500F  42
5010  4F
5011  52
5012  54
5013  A9                         DEFB    ')'+80H
5014  E24F                       DEFW    DFIND-8
                                 ENDM
5016            13860 PABOR      DW3     DOCOL,ABORT,SEMIS
5016  2448                       DEFW    DOCOL
5018  6952                       DEFW    ABORT
501A  5B46                       DEFW    SEMIS
                                 ENDM
                13870 ;
501C            13880            HD      5,ERRO,R,PABOR-0AH
501C  85                         DEFB    5+80H
501D  45                         DEFM    'ERRO'
501E  52
501F  52
5020  4F
5021  D2                         DEFB    'R'+80H
5022  0C50                       DEFW    PABOR-0AH
                                 ENDM
5024            13890 ERROR      DW7     DOCOL,WARN,AT,ZLESS,ZBRAN,ERRO1-$,PABOR
5024  2448                       DEFW    DOCOL
5026  4549                       DEFW    WARN
5028  AA47                       DEFW    AT
502A  CA46                       DEFW    ZLESS
502C  C643                       DEFW    ZBRAN
502E  0400                       DEFW    ERRO1-$
5030  1650                       DEFW    PABOR
                                 ENDM
5032            13900 ERRO1      DW4     HERE,COUNT,TYPE,PDOTQ
5032  164A                       DEFW    HERE
5034  FA4C                       DEFW    COUNT
5036  0D4D                       DEFW    TYPE
5038  6E4D                       DEFW    PDOTQ
                                 ENDM
503A            13910            DB      2
503A  02                         DEFB    2
                                 ENDM
503B  3F       13920            DEFM    '? '
503C  20
503D            13930            DW2     MESS,SPSTO
503D  8054                       DEFW    MESS
503F  1E46                       DEFW    SPSTO
                                 ENDM
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                13940 ; CHANGE FROM FIG MODEL
                13950 ;         DW      INN,AT,BLK,AT
5041            13960           DW8     BLK,AT,DDUP,ZBRAN,ERRO2-$,INN,AT,SWAP
5041 7049                       DEFW    BLK
5043 AA47                       DEFW    AT
5045 E34A                       DEFW    DDUP
5047 C643                       DEFW    ZBRAN
5049 0800                       DEFW    ERRO2-$
504B 7849                       DEFW    INN
504D AA47                       DEFW    AT
504F 5C47                       DEFW    SWAP
                                ENDM
5051            13970 ERRO2     DW      QUIT
5051 3C52                       DEFW    QUIT
                                ENDM
                13980 ;
5053            13990           HD      3,ID,.,ERROR-8
5053 83                         DEFB    3+80H
5054 49                         DEFM    'ID'
5055 44
5056 AE                         DEFB    '.'+80H
5057 1C50                       DEFW    ERROR-8
                                ENDM
5059            14000 IDDOT     DW8     DOCOL,PAD,LIT,20H,LIT,5FH,FILL,DUP
5059 2448                       DEFW    DOCOL
505B E34E                       DEFW    PAD
505D 8D43                       DEFW    LIT
505F 2000                       DEFW    20H
5061 8D43                       DEFW    LIT
5063 5F00                       DEFW    5FH
5065 8D4E                       DEFW    FILL
5067 6947                       DEFW    DUP
                                ENDM
5069            14010           DW8     PFA,LFA,OVER,SUBB,PAD,SWAP,CMOVE,PAD
5069 634B                       DEFW    PFA
506B 2F4B                       DEFW    LFA
506D 4047                       DEFW    OVER
506F 5A4A                       DEFW    SUBB
5071 E34E                       DEFW    PAD
5073 5C47                       DEFW    SWAP
5075 4445                       DEFW    CMOVE
5077 E34E                       DEFW    PAD
                                ENDM
5079            14020           DW7     COUNT,LIT,1FH,ANDD,TYPE,SPACE,SEMIS
5079 FA4C                       DEFW    COUNT
507B 8D43                       DEFW    LIT
507D 1F00                       DEFW    1FH
507F D745                       DEFW    ANDD
5081 0D4D                       DEFW    TYPE
5083 D44A                       DEFW    SPACE
5085 5B46                       DEFW    SEMIS
                                ENDM
                14030 ;
5087            14040           HD      6,CREAT,E,IDDOT-6
5087 86                         DEFB    6+80H
5088 43                         DEFM    'CREAT'
5089 52
508A 45
```

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508B 41
508C 54
508D C5                      DEFB     'E'+80H
508E 5350                    DEFW     IDDOT-6
                             ENDM
5090          14050 CREAT    DW8      DOCOL,DFIND,ZBRAN,CREA1-$,DROP,NFA.IDDOT.LIT

5090 2448                    DEFW     DOCOL
5092 EA4F                    DEFW     DFIND
5094 C643                    DEFW     ZBRAN
5096 1000                    DEFW     CREA1-$
5098 4F47                    DEFW     DROP
509A 4D4B                    DEFW     NFA
509C 5950                    DEFW     IDDOT
509E 8D43                    DEFW     LIT
                             ENDM
50A0          14060          DW3      4,MESS,SPACE
50A0 0400                    DEFW     4
50A2 8054                    DEFW     MESS
50A4 D44A                    DEFW     SPACE
                             ENDM
50A6          14070 CREA1    DW8      HERE,DUP,CAT,WIDTH,AT,MIN,ONEP.ALLOT
50A6 164A                    DEFW     HERE
50A8 6947                    DEFW     DUP
50AA B947                    DEFW     CAT
50AC 3849                    DEFW     WIDTH
50AE AA47                    DEFW     AT
50B0 5953                    DEFW     MIN
50B2 FA49                    DEFW     ONEP
50B4 264A                    DEFW     ALLOT
                             ENDM
50B6          14080          DW8      DUP,LIT,0A0H,TOGGL,HERE,ONE,SUBB.LIT
50B6 6947                    DEFW     DUP
50B8 8D43                    DEFW     LIT
50BA A000                    DEFW     0A0H
50BC 9C47                    DEFW     TOGGL
50BE 164A                    DEFW     HERE
50C0 AA48                    DEFW     ONE
50C2 5A4A                    DEFW     SUBB
50C4 8D43                    DEFW     LIT
                             ENDM
50C6          14090          DW8      80H,TOGGL,LATES,COMMA,CURR,AT.STORE,HERE
50C6 8000                    DEFW     80H
50C8 9C47                    DEFW     TOGGL
50CA 1F4B                    DEFW     LATES
50CC 324A                    DEFW     COMMA
50CE B049                    DEFW     CURR
50D0 AA47                    DEFW     AT
50D2 E147                    DEFW     STORE
50D4 164A                    DEFW     HERE
                             ENDM
50D6          14100          DW3      TWOP,COMMA,SEMIS
50D6 074A                    DEFW     TWOP
50D8 324A                    DEFW     COMMA
50DA 5B46                    DEFW     SEMIS
                             ENDM
              14110 ;
50DC          14120          DB       0C9H        ; LBRAC COMPILE RBRAC
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50DC C9                      DEFB     0C9H
                             ENDM
50DD            14130        DB       5BH
50DD 5B                      DEFB     5BH
                             ENDM
50DE            14140        DM       COMPILE
50DE 43                      DEFM     'COMPILE'
50DF 4F
50E0 4D
50E1 50
50E2 49
50E3 4C
50E4 45
                             ENDM
50E5            14150        DB       0DDH
50E5 DD                      DEFB     0DDH
                             ENDM
50E6            14160        DW       CREAT-9
50E6 8750                    DEFW     CREAT-9
                             ENDM
50E8            14170 BCOMP  DW8      DOCOL,DFIND,ZEQU,ZERO,QERR,DROP.CFA,COMMA
50E8 2448                    DEFW     DOCOL
50EA EA4F                    DEFW     DFIND
50EC B746                    DEFW     ZEQU
50EE A248                    DEFW     ZERO
50F0 8B4B                    DEFW     QERR
50F2 4F47                    DEFW     DROP
50F4 3F4B                    DEFW     CFA
50F6 324A                    DEFW     COMMA
                             ENDM
50F8            14180        DW       SEMIS
50F8 5B46                    DEFW     SEMIS
                             ENDM
                14190 ;
50FA            14200        HD       47H,LITERA,L,BCOMP-0CH
50FA C7                      DEFB     47H+80H
50FB 4C                      DEFM     'LITERA'
50FC 49
50FD 54
50FE 45
50FF 52
5100 41
5101 CC                      DEFB     'L'+80H
5102 DC50                    DEFW     BCOMP-0CH
                             ENDM
5104            14210 LITER  DW8      DOCOL,STATE,AT,ZBRAN,LITE1-$,COMP.LIT.COMMA
5104 2448                    DEFW     DOCOL
5106 BB49                    DEFW     STATE
5108 AA47                    DEFW     AT
510A C643                    DEFW     ZBRAN
510C 0800                    DEFW     LITE1-$
510E 1E4C                    DEFW     COMP
5110 8D43                    DEFW     LIT
5112 324A                    DEFW     COMMA
                             ENDM
5114            14220 LITE1  DW       SEMIS
5114 5B46                    DEFW     SEMIS
                             ENDM
```

```
                    14230 ;
5116                14240           HD      48H,DLITERA,L,LITER-0AH
5116 C8                             DEFB    48H+80H
5117 44                             DEFM    'DLITERA'
5118 4C
5119 49
511A 54
511B 45
511C 52
511D 41
511E CC                             DEFB    'L'+80H
511F FA50                           DEFW    LITER-0AH
                                    ENDM
5121                14250 DLITE     DW8     DOCOL,STATE,AT,ZBRAN,DLIT1-$.SWAP.LITER.LITE
R
5121 2448                           DEFW    DOCOL
5123 BB49                           DEFW    STATE
5125 AA47                           DEFW    AT
5127 C643                           DEFW    ZBRAN
5129 0800                           DEFW    DLIT1-$
512B 5C47                           DEFW    SWAP
512D 0451                           DEFW    LITER
512F 0451                           DEFW    LITER
                                    ENDM
5131                14260 DLIT1     DW      SEMIS
5131 5B46                           DEFW    SEMIS
                                    ENDM
                    14270 ;
5133                14280           HD      6,?STAC,K,DLITE-0BH
5133 86                             DEFB    6+80H
5134 3F                             DEFM    '?STAC'
5135 53
5136 54
5137 41
5138 43
5139 CB                             DEFB    'K'+80H
513A 1651                           DEFW    DLITE-0BH
                                    ENDM
513C                14290 QSTAC     DW8     DOCOL,SPAT,SZERO,AT,SWAP,ULESS.ONE.QERR
513C 2448                           DEFW    DOCOL
513E 0F46                           DEFW    SPAT
5140 1A49                           DEFW    SZERO
5142 AA47                           DEFW    AT
5144 5C47                           DEFW    SWAP
5146 964A                           DEFW    ULESS
5148 AA48                           DEFW    ONE
514A 8B4B                           DEFW    QERR
                                    ENDM
514C                14300           DW8     SPAT,HERE,LIT,80H,PLUS,ULESS,LIT.7
514C 0F46                           DEFW    SPAT
514E 164A                           DEFW    HERE
5150 8D43                           DEFW    LIT
5152 8000                           DEFW    80H
5154 DC46                           DEFW    PLUS
5156 964A                           DEFW    ULESS
5158 8D43                           DEFW    LIT
515A 0700                           DEFW    7
                                    ENDM
```

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515C          14310          DW2     QERR,SEMIS
515C 8B4B                     DEFW    QERR
515E 5B46                     DEFW    SEMIS
                             ENDM
              14320 ;
5160          14330          HD      9,INTERPRE,T,QSTAC-9
5160 89                       DEFB    9+80H
5161 49                       DEFM    ' INTERPRE'
5162 4E
5163 54
5164 45
5165 52
5166 50
5167 52
5168 45
5169 D4                       DEFB    'T'+80H
516A 3351                     DEFW    QSTAC-9
                             ENDM
516C          14340 INTER    DW      DOCOL
516C 2448                     DEFW    DOCOL
                             ENDM
516E          14350 INTE1    DW8     DFIND,ZBRAN,INTE2-$,STATE,AT,LESS,ZBRAN,INTE
3-$
516E EA4F                     DEFW    DFIND
5170 C643                     DEFW    ZBRAN
5172 1E00                     DEFW    INTE2-$
5174 BB49                     DEFW    STATE
5176 AA47                     DEFW    AT
5178 744A                     DEFW    LESS
517A C643                     DEFW    ZBRAN
517C 0A00                     DEFW    INTE3-$
                             ENDM
517E          14360          DW4     CFA,COMMA,BRAN,INTE4-$
517E 3F4B                     DEFW    CFA
5180 324A                     DEFW    COMMA
5182 AF43                     DEFW    BRAN
5184 0600                     DEFW    INTE4-$
                             ENDM
5186          14370 INTE3    DW2     CFA,EXEC
5186 3F4B                     DEFW    CFA
5188 A143                     DEFW    EXEC
                             ENDM
518A          14380 INTE4    DW3     QSTAC,BRAN,INTE5-$
518A 3C51                     DEFW    QSTAC
518C AF43                     DEFW    BRAN
518E 1C00                     DEFW    INTE5-$
                             ENDM
5190          14390 INTE2    DW8     HERE,NUMB,DPL,AT,ONEP,ZBRAN,INTE6-$,DLITE
5190 164A                     DEFW    HERE
5192 924F                     DEFW    NUMB
5194 CE49                     DEFW    DPL
5196 AA47                     DEFW    AT
5198 FA49                     DEFW    ONEP
519A C643                     DEFW    ZBRAN
519C 0800                     DEFW    INTE6-$
519E 2151                     DEFW    DLITE
                             ENDM
51A0          14400          DW2     BRAN,INTE7-$
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51A0  AF43                      DEFW    BRAN
51A2  0600                      DEFW    INTE7-$
                        ENDM
51A4              14410 INTE6   DW2     DROP,LITER
51A4  4F47                      DEFW    DROP
51A6  0451                      DEFW    LITER
                        ENDM
51A8              14420 INTE7   DW      QSTAC
51A8  3C51                      DEFW    QSTAC
                        ENDM
51AA              14430 INTE5   DW2     BRAN,INTE1-$
51AA  AF43                      DEFW    BRAN
51AC  C2FF                      DEFW    INTE1-$
                        ENDM
                  14440 ;
51AE              14450         HD      9,IMMEDIAT,E,INTER-0CH
51AE  89                        DEFB    9+80H
51AF  49                        DEFM    'IMMEDIAT'
51B0  4D
51B1  4D
51B2  45
51B3  44
51B4  49
51B5  41
51B6  54
51B7  C5                        DEFB    'E'+80H
51B8  6051                      DEFW    INTER-0CH
                        ENDM
51BA              14460 IMMED   DW6     DOCOL,LATES,LIT,40H,TOGGL,SEMIS
51BA  2448                      DEFW    DOCOL
51BC  1F4B                      DEFW    LATES
51BE  8D43                      DEFW    LIT
51C0  4000                      DEFW    40H
51C2  9C47                      DEFW    TOGGL
51C4  5B46                      DEFW    SEMIS
                        ENDM         .
                  14470 ;
51C6              14480         HD      0AH,VOCABULAR,Y,IMMED-0CH
51C6  8A                        DEFB    0AH+80H
51C7  56                        DEFM    'VOCABULAR'
51C8  4F
51C9  43
51CA  41
51CB  42
51CC  55
51CD  4C
51CE  41
51CF  52
51D0  D9                        DEFB    'Y'+80H
51D1  AE51                      DEFW    IMMED-0CH
                        ENDM
51D3              14490 VOCAB   DW8     DOCOL,BUILD,LIT,0A081H,COMMA,CURR,AT,CFA
51D3  2448                      DEFW    DOCOL
51D5  C34C                      DEFW    BUILD
51D7  8D43                      DEFW    LIT
51D9  81A0                      DEFW    0A081H
51DB  324A                      DEFW    COMMA
51DD  B049                      DEFW    CURR
```

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51DF  AA47                        DEFW      AT
51E1  3F4B                        DEFW      CFA
                                  ENDM
51E3              14500           DW8       COMMA,HERE,VOCL,AT,COMMA,VOCL,STORE.DOES
51E3  324A                        DEFW      COMMA
51E5  164A                        DEFW      HERE
51E7  6649                        DEFW      VOCL
51E9  AA47                        DEFW      AT
51EB  324A                        DEFW      COMMA
51ED  6649                        DEFW      VOCL
51EF  E147                        DEFW      STORE
51F1  D34C                        DEFW      DOES
                                  ENDM
51F3              14510 DOVAC     DW4       TWOP,CONT,STORE,SEMIS
51F3  074A                        DEFW      TWOP
51F5  A349                        DEFW      CONT
51F7  E147                        DEFW      STORE
51F9  5B46                        DEFW      SEMIS
                                  ENDM
                  14520 ;
51FB              14530           HD        45H,FORT,H,VOCAB-0DH
51FB  C5                          DEFB      45H+80H
51FC  46                          DEFM      'FORT'
51FD  4F
51FE  52
51FF  54
5200  C8                          DEFB      'H'+80H
5201  C651                        DEFW      VOCAB-0DH
                                  ENDM
5203              14540 FORTH     DW5       DODOE,DOVAC,0A081H,TASK-7.0
5203  DF4C                        DEFW      DODOE
5205  F351                        DEFW      DOVAC
5207  81A0                        DEFW      0A081H
5209  535B                        DEFW      TASK-7
520B  0000                        DEFW      0
                                  ENDM
                  14550 ; LAST WORD = 0
                  14560 ;   CHGD EACH TIME A DEF IS ADDED TO THE FORTH VOCABULARY
                  14570 ;
520D              14580           HD        0B,DEFINITION,S,FORTH-8
520D  8B                          DEFB      0B+80H
520E  44                          DEFM      'DEFINITION'
520F  45
5210  46
5211  49
5212  4E
5213  49
5214  54
5215  49
5216  4F
5217  4E
5218  D3                          DEFB      'S'+80H
5219  FB51                        DEFW      FORTH-8
                                  ENDM
521B              14590 DEFIN     DW6       DOCOL,CONT,AT,CURR,STORE,SEMIS
521B  2448                        DEFW      DOCOL
521D  A349                        DEFW      CONT
521F  AA47                        DEFW      AT
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5221 B049                    DEFW    CURR
5223 E147                    DEFW    STORE
5225 5B46                    DEFW    SEMIS
                            ENDM
            14600 ;
5227        14610           DB      0C1H
5227 C1                     DEFB    0C1H
                            ENDM
5228        14620           MB      (
5228 A8                     DEFB    '(' +80H
                            ENDM
5229        14630           DW      DEFIN-0EH
5229 0D52                   DEFW    DEFIN-0EH
                            ENDM
522B        14640 PAREN     DW5     DOCOL,LIT,29H,WORD,SEMIS
522B 2448                   DEFW    DOCOL
522D 8D43                   DEFW    LIT
522F 2900                   DEFW    29H
5231 F64E                   DEFW    WORD
5233 5B46                   DEFW    SEMIS
                            ENDM
            14650 ;
5235        14660           HD      4,QUI,T,PAREN-4
5235 84                     DEFB    4+80H
5236 51                     DEFM    'QUI'
5237 55
5238 49
5239 D4                     DEFB    'T' +80H
523A 2752                   DEFW    PAREN-4
                            ENDM
523C        14670 QUIT      DW5     DOCOL,ZERO,BLK,STORE,LBRAC
523C 2448                   DEFW    DOCOL
523E A248                   DEFW    ZERO
5240 7049                   DEFW    BLK
5242 E147                   DEFW    STORE
5244 344C                   DEFW    LBRAC
                            ENDM
5246        14680 QUIT1     DW8     RPSTO,CR,QUERY,INTER,STATE,AT,ZEQU,ZBRAN
5246 4346                   DEFW    RPSTO
5248 3745                   DEFW    CR
524A 364E                   DEFW    QUERY
524C 6C51                   DEFW    INTER
524E BB49                   DEFW    STATE
5250 AA47                   DEFW    AT
5252 B746                   DEFW    ZEQU
5254 C643                   DEFW    ZBRAN
                            ENDM
5256        14690           DW2     QUIT2-$,PDOTQ
5256 0700                   DEFW    QUIT2-$
5258 6E4D                   DEFW    PDOTQ
                            ENDM
525A        14700           DB      2
525A 02                     DEFB    2
                            ENDM
525B        14710           DM      OK
525B 4F                     DEFM    'OK'
525C 4B
                            ENDM
```

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525D            14720 QUIT2     DW2     BRAN,QUIT1-$
525D AF43                       DEFW    BRAN
525F E7FF                       DEFW    QUIT1-$
                                ENDM
                14730 ;
5261            14740           HD      5,ABOR,T,QUIT-7
5261 85                         DEFB    5+80H
5262 41                         DEFM    'ABOR'
5263 42
5264 4F
5265 52
5266 D4                         DEFB    'T'+80H
5267 3552                       DEFW    QUIT-7
                                ENDM
5269            14750 ABORT     DW7     DOCOL,SPSTO,DEC,QSTAC,CR,DOTCPU,PDOTQ
5269 2448                       DEFW    DOCOL
526B 1E46                       DEFW    SPSTO
526D 7F4C                       DEFW    DEC
526F 3C51                       DEFW    QSTAC
5271 3745                       DEFW    CR
5273 355B                       DEFW    DOTCPU
5275 6E4D                       DEFW    PDOTQ
                                ENDM
5277            14760           DB      0DH
5277 0D                         DEFB    0DH
                                ENDM
5278 45         14770           DEFM    'ESF FORTH '
5279 53
527A 46
527B 20
527C 46
527D 4F
527E 52
527F 54
5280 48
5281 20
5282            14780           DB      RELEAS+30H
5282 31                         DEFB    RELEAS+30H
                                ENDM
5283            14790           DB      ADOT
5283 2E                         DEFB    ADOT
                                ENDM
5284            14800           DB      REVISI+30H
5284 30                         DEFB    REVISI+30H
                                ENDM
5285            14810           DW3     FORTH,DEFIN,QUIT
5285 0352                       DEFW    FORTH
5287 1B52                       DEFW    DEFIN
5289 3C52                       DEFW    QUIT
                                ENDM
                14820 ;
528B            14830 WRM       EQU     $
528B 3E0E       14840           LD      A,0EH   ; TURN ON CURSOR
528D CD3300     14850           CALL    DSPLY
5290 019652     14860           LD      BC,WRM1
5293 C37C43     14870           JP      NEXT
5296            14880 WRM1      DW      WARM
5296 9F52                       DEFW    WARM
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                              ENDM
                     14890 ;
5298                 14900          HD      4,WAR,M,ABORT-8
5298 84                             DEFB    4+80H
5299 57                             DEFM    'WAR'
529A 41
529B 52
529C CD                             DEFB    'M'+80H
529D 6152                           DEFW    ABORT-8
                              ENDM
529F                 14910 WARM     DW3     DOCOL,MTBUF,ABORT
529F 2448                           DEFW    DOCOL
52A1 F355                           DEFW    MTBUF
52A3 6952                           DEFW    ABORT
                              ENDM
                     14920 ;
52A5                 14930 CLD      EQU     $
52A5 3E0E            14940          LD      A,0EH    ; TURN ON CURSOR
52A7 CD3300          14950          CALL    DSPLY
52AA 218B52          14960          LD      HL,WRM   ; SET UP RETURN
52AD 22DF40          14970          LD      (40DFH),HL
52B0 01BA52          14980          LD      BC,CLD1
52B3 2A6243          14990          LD      HL,(ORIG+12H)
52B6 F9              15000          LD      SP,HL
52B7 C37C43          15010          JP      NEXT
52BA                 15020 CLD1     DW      COLD
52BA C352                           DEFW    COLD
                              ENDM
                     15030 ;
52BC                 15040          HD      4,COL,D,WARM-7
52BC 84                             DEFB    4+80H
52BD 43                             DEFM    'COL'
52BE 4F
52BF 4C
52C0 C4                             DEFB    'D'+80H
52C1 9852                           DEFW    WARM-7
                              ENDM
52C3                 15050 COLD     DW5     DOCOL,MTBUF,LIT,BUF1,USE
52C3 2448                           DEFW    DOCOL
52C5 F355                           DEFW    MTBUF
52C7 8D43                           DEFW    LIT
52C9 E473                           DEFW    BUF1
52CB 8255                           DEFW    USE
                              ENDM
52CD                 15060          DW6     STORE,LIT,BUF1,PREV,STORE.DRZER
52CD E147                           DEFW    STORE
52CF 8D43                           DEFW    LIT
52D1 E473                           DEFW    BUF1
52D3 8D55                           DEFW    PREV
52D5 E147                           DEFW    STORE
52D7 0756                           DEFW    DRZER
                              ENDM
52D9                 15070          DW5     LIT,ORIG+12H,LIT,UP,AT
52D9 8D43                           DEFW    LIT
52DB 6243                           DEFW    ORIG+12H
52DD 8D43                           DEFW    LIT
52DF 7643                           DEFW    UP
52E1 AA47                           DEFW    AT
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                                ENDM
52E3            15080           DW8     LIT,6,PLUS,LIT,10H,CMOVE,LIT,ORIG+0CH
52E3 8D43                       DEFW    LIT
52E5 0600                       DEFW    6
52E7 DC46                       DEFW    PLUS
52E9 8D43                       DEFW    LIT
52EB 1000                       DEFW    10H
52ED 4445                       DEFW    CMOVE
52EF 8D43                       DEFW    LIT
52F1 5C43                       DEFW    ORIG+0CH
                                ENDM
52F3            15090           DW5     AT,LIT,FORTH+6,STORE,ABORT
52F3 AA47                       DEFW    AT
52F5 8D43                       DEFW    LIT
52F7 0952                       DEFW    FORTH+6
52F9 E147                       DEFW    STORE
52FB 6952                       DEFW    ABORT
                                ENDM
                15100 ;
52FD            15110           HD      4,S->,D,COLD-7
52FD 84                         DEFB    4+80H
52FE 53                         DEFM    'S->'
52FF 2D
5300 3E
5301 C4                         DEFB    'D'+80H
5302 BC52                       DEFW    COLD-7
                                ENDM
5304            15120 STOD      DW      $+2
5304 0653                       DEFW    $+2
                                ENDM
5306 D1         15130           POP     DE
5307 210000     15140           LD      HL,0
530A 7A         15150           LD      A,D
530B E680       15160           AND     80H
530D 2801       15170           JR      Z,STOD1
530F 2B         15180           DEC     HL
5310 C37A43     15190 STOD1     JP      DPUSH
                15200 ;
5313            15210           HD      2,+,-,STOD-7
5313 82                         DEFB    2+80H
5314 2B                         DEFM    '+'
5315 AD                         DEFB    '-'+80H
5316 FD52                       DEFW    STOD-7
                                ENDM
5318            15220 PM        DW5     DOCOL,ZLESS,ZBRAN,PM1-$,MINUS
5318 2448                       DEFW    DOCOL
531A CA46                       DEFW    ZLESS
531C C643                       DEFW    ZBRAN
531E 0400                       DEFW    PM1-$
5320 0C47                       DEFW    MINUS
                                ENDM
5322            15230 PM1       DW      SEMIS
5322 5B46                       DEFW    SEMIS
                                ENDM
                15240 ;
5324            15250           HD      3,D+,-,PM-5
5324 83                         DEFB    3+80H
5325 44                         DEFM    'D+'
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5326 2B
5327 AD                          DEFB    '-'+80H
5328 1353                        DEFW    PM-5
                                 ENDM
532A            15260 DPM        DW5     DOCOL,ZLESS,ZBRAN,DPM1-$,DMINU
532A 2448                        DEFW    DOCOL
532C CA46                        DEFW    ZLESS
532E C643                        DEFW    ZBRAN
5330 0400                        DEFW    DPM1-$
5332 2247                        DEFW    DMINU
                                 ENDM
5334            15270 DPM1       DW      SEMIS
5334 5B46                        DEFW    SEMIS
                                 ENDM
                15280 ;
5336            15290            HD      3,AB,S,DPM-6
5336 83                          DEFB    3+80H
5337 41                          DEFM    'AB'
5338 42
5339 D3                          DEFB    'S'+80H
533A 2453                        DEFW    DPM-6
                                 ENDM
533C            15300 ABS        DW4     DOCOL,DUP,PM,SEMIS
533C 2448                        DEFW    DOCOL
533E 6947                        DEFW    DUP
5340 1853                        DEFW    PM
5342 5B46                        DEFW    SEMIS
                                 ENDM
                15310 ;
5344            15320            HD      4,DAB,S,ABS-6
5344 84                          DEFB    4+80H
5345 44                          DEFM    'DAB'
5346 41
5347 42
5348 D3                          DEFB    'S'+80H
5349 3653                        DEFW    ABS-6
                                 ENDM
534B            15330 DABS       DW4     DOCOL,DUP,DPM,SEMIS
534B 2448                        DEFW    DOCOL
534D 6947                        DEFW    DUP
534F 2A53                        DEFW    DPM
5351 5B46                        DEFW    SEMIS
                                 ENDM
                15340 ;
5353            15350            HD      3,MI,N,DABS-7
5353 83                          DEFB    3+80H
5354 4D                          DEFM    'MI'
5355 49
5356 CE                          DEFB    'N'+80H
5357 4453                        DEFW    DABS-7
                                 ENDM
5359            15360 MIN        DW6     DOCOL,TDUP,GREAT,ZBRAN,MIN1-$,SWAP
5359 2448                        DEFW    DOCOL
535B 7747                        DEFW    TDUP
535D B64A                        DEFW    GREAT
535F C643                        DEFW    ZBRAN
5361 0400                        DEFW    MIN1-$
5363 5C47                        DEFW    SWAP
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                                ENDM
5365                15370 MIN1   DW2       DROP,SEMIS
5365  4F47                       DEFW      DROP
5367  5B46                       DEFW      SEMIS
                                ENDM
                    15380 ;
5369                15390        HD        3,MA,X,MIN-6
5369  83                         DEFB      3+80H
536A  4D                         DEFM      'MA'
536B  41
536C  D8                         DEFB      'X'+80H
536D  5353                       DEFW      MIN-6
                                ENDM
536F                15400 MAX    DW6       DOCOL,TDUP,LESS,ZBRAN,MAX1-$,SWAP
536F  2448                       DEFW      DOCOL
5371  7747                       DEFW      TDUP
5373  744A                       DEFW      LESS
5375  C643                       DEFW      ZBRAN
5377  0400                       DEFW      MAX1-$
5379  5C47                       DEFW      SWAP
                                ENDM
537B                15410 MAX1   DW2       DROP,SEMIS
537B  4F47                       DEFW      DROP
537D  5B46                       DEFW      SEMIS
                                ENDM
                    15420 ;
537F                15430        HD        2,M,*,MAX-6
537F  82                         DEFB      2+80H
5380  4D                         DEFM      'M'
5381  AA                         DEFB      '*'+80H
5382  6953                       DEFW      MAX-6
                                ENDM
5384                15440 MSTAR  DW8       DOCOL,TDUP,XORR,TOR,ABS,SWAP,ABS,USTAR
5384  2448                       DEFW      DOCOL
5386  7747                       DEFW      TDUP
5388  FC45                       DEFW      XORR
538A  8646                       DEFW      TOR
538C  3C53                       DEFW      ABS
538E  5C47                       DEFW      SWAP
5390  3C53                       DEFW      ABS
5392  5645                       DEFW      USTAR
                                ENDM
5394                15450        DW3       FROMR,DPM,SEMIS
5394  9C46                       DEFW      FROMR
5396  2A53                       DEFW      DPM
5398  5B46                       DEFW      SEMIS
                                ENDM
                    15460 ;
539A                15470        HD        2,M,/,MSTAR-5
539A  82                         DEFB      2+80H
539B  4D                         DEFM      'M'
539C  AF                         DEFB      '/'+80H
539D  7F53                       DEFW      MSTAR-5
                                ENDM
539F                15480 MSLAS  DW8       DOCOL,OVER,TOR,TOR,DABS,RR,ABS.USLAS
539F  2448                       DEFW      DOCOL
53A1  4047                       DEFW      OVER
53A3  8646                       DEFW      TOR
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53A5  8646                     DEFW    TOR
53A7  4B53                     DEFW    DABS
53A9  B046                     DEFW    RR
53AB  3C53                     DEFW    ABS
53AD  8A45                     DEFW    USLAS
                               ENDM
53AF            15490          DW8     FROMR,RR,XORR,PM,SWAP,FROMR,PM,SWAP
53AF  9C46                     DEFW    FROMR
53B1  B046                     DEFW    RR
53B3  FC45                     DEFW    XORR
53B5  1853                     DEFW    PM
53B7  5C47                     DEFW    SWAP
53B9  9C46                     DEFW    FROMR
53BB  1853                     DEFW    PM
53BD  5C47                     DEFW    SWAP
                               ENDM
53BF            15500          DW      SEMIS
53BF  5B46                     DEFW    SEMIS
                               ENDM
                15510 ;
53C1            15520          DB      81H
53C1  81                       DEFB    81H
                               ENDM
53C2            15530          MB      *
53C2  AA                       DEFB    '*'+80H
                               ENDM
53C3            15540          DW      MSLAS-5
53C3  9A53                     DEFW    MSLAS-5
                               ENDM
53C5            15550 STAR     DW4     DOCOL,MSTAR,DROP,SEMIS
53C5  2448                     DEFW    DOCOL
53C7  8453                     DEFW    MSTAR
53C9  4F47                     DEFW    DROP
53CB  5B46                     DEFW    SEMIS
                               ENDM
                15560 ;
53CD            15570          HD      4,/MO,D,STAR-4
53CD  84                       DEFB    4+80H
53CE  2F                       DEFM    '/MO'
53CF  4D
53D0  4F
53D1  C4                       DEFB    'D'+80H
53D2  C153                     DEFW    STAR-4
                               ENDM
53D4            15580 SLMOD    DW6     DOCOL,TOR,STOD,FROMR,MSLAS,SEMIS
53D4  2448                     DEFW    DOCOL
53D6  8646                     DEFW    TOR
53D8  0453                     DEFW    STOD
53DA  9C46                     DEFW    FROMR
53DC  9F53                     DEFW    MSLAS
53DE  5B46                     DEFW    SEMIS
                               ENDM
                15590 ;
53E0            15600          DB      81H
53E0  81                       DEFB    81H
                               ENDM
53E1            15610          MB      /
53E1  AF                       DEFB    '/'+80H
```

```
                                ENDM
53E2              15620         DW      SLMOD-7
53E2 CD53                       DEFW    SLMOD-7
                                ENDM
53E4              15630 SLASH   DW5     DOCOL,SLMOD,SWAP,DROP,SEMIS
53E4 2448                       DEFW    DOCOL
53E6 D453                       DEFW    SLMOD
53E8 5C47                       DEFW    SWAP
53EA 4F47                       DEFW    DROP
53EC 5B46                       DEFW    SEMIS
                                ENDM
                  15640 ;
53EE              15650         HD      3,MO,D,SLASH-4
53EE 83                         DEFB    3+80H
53EF 4D                         DEFM    'MO'
53F0 4F
53F1 C4                         DEFB    'D'+80H
53F2 E053                       DEFW    SLASH-4
                                ENDM
53F4              15660 MODD    DW4     DOCOL,SLMOD,DROP,SEMIS
53F4 2448                       DEFW    DOCOL
53F6 D453                       DEFW    SLMOD
53F8 4F47                       DEFW    DROP
53FA 5B46                       DEFW    SEMIS
                                ENDM
                  15670 ;
53FC              15680         HD      5,*/MO,D,MODD-6
53FC 85                         DEFB    5+80H
53FD 2A                         DEFM    '*/MO'
53FE 2F
53FF 4D
5400 4F
5401 C4                         DEFB    'D'+80H
5402 EE53                       DEFW    MODD-6
                                ENDM
5404              15690 SSMOD   DW6     DOCOL,TOR,MSTAR,FROMR,MSLAS,SEMIS
5404 2448                       DEFW    DOCOL
5406 8646                       DEFW    TOR
5408 8453                       DEFW    MSTAR
540A 9C46                       DEFW    FROMR
540C 9F53                       DEFW    MSLAS
540E 5B46                       DEFW    SEMIS
                                ENDM
                  15700 ;
5410              15710         HD      2,*,/,SSMOD-8
5410 82                         DEFB    2+80H
5411 2A                         DEFM    '*'
5412 AF                         DEFB    '/'+80H
5413 FC53                       DEFW    SSMOD-8
                                ENDM
5415              15720 SSLA    DW5     DOCOL,SSMOD,SWAP,DROP,SEMIS
5415 2448                       DEFW    DOCOL
5417 0454                       DEFW    SSMOD
5419 5C47                       DEFW    SWAP
541B 4F47                       DEFW    DROP
541D 5B46                       DEFW    SEMIS
                                ENDM
                  15730 ;
```

```
541F              15740        HD       5,M/MO,D,SSLA-5
541F  85                       DEFB     5+80H
5420  4D                       DEFM     'M/MO'
5421  2F
5422  4D
5423  4F
5424  C4                       DEFB     'D'+80H
5425  1054                     DEFW     SSLA-5
                               ENDM
5427              15750 MSMOD  DW8      DOCOL,TOR,ZERO,RR,USLAS,FROMR,SWAP,TOR
5427  2448                     DEFW     DOCOL
5429  8646                     DEFW     TOR
542B  A248                     DEFW     ZERO
542D  B046                     DEFW     RR
542F  8A45                     DEFW     USLAS
5431  9C46                     DEFW     FROMR
5433  5C47                     DEFW     SWAP
5435  8646                     DEFW     TOR
                               ENDM
5437              15760        DW3      USLAS,FROMR,SEMIS
5437  8A45                     DEFW     USLAS
5439  9C46                     DEFW     FROMR
543B  5B46                     DEFW     SEMIS
                               ENDM
                  15770 ;
543D              15780        HD       6,(LINE,),MSMOD-8
543D  86                       DEFB     6+80H
543E  28                       DEFM     '(LINE'
543F  4C
5440  49
5441  4E
5442  45
5443  A9                       DEFB     ')'+80H
5444  1F54                     DEFW     MSMOD-8
                               ENDM
5446              15790 PLINE  DW8      DOCOL,TOR,LIT,40H,BBUF,SSMOD,FROMR,BSCR
5446  2448                     DEFW     DOCOL
5448  8646                     DEFW     TOR
544A  8D43                     DEFW     LIT
544C  4000                     DEFW     40H
544E  F148                     DEFW     BBUF
5450  0454                     DEFW     SSMOD
5452  9C46                     DEFW     FROMR
5454  FD48                     DEFW     BSCR
                               ENDM
5456              15800        DW7      STAR,PLUS,BLOCK,PLUS,LIT,40H,SEMIS
5456  C553                     DEFW     STAR
5458  DC46                     DEFW     PLUS
545A  6256                     DEFW     BLOCK
545C  DC46                     DEFW     PLUS
545E  8D43                     DEFW     LIT
5460  4000                     DEFW     40H
5462  5B46                     DEFW     SEMIS
                               ENDM
                  15810 ;
5464              15820        HD       5,.LIN,E,PLINE-9
5464  85                       DEFB     5+80H
5465  2E                       DEFM     '.LIN'
```

```
5466  4C
5467  49
5468  4E
5469  C5                                    DEFB    'E'+80H
546A  3D54                                  DEFW    PLINE-9
                                            ENDM
546C              15830 DLINE       DW5     DOCOL,PLINE,DTRAI,TYPE,SEMIS
546C  2448                                  DEFW    DOCOL
546E  4654                                  DEFW    PLINE
5470  3B4D                                  DEFW    DTRAI
5472  0D4D                                  DEFW    TYPE
5474  5B46                                  DEFW    SEMIS
                                            ENDM
                  15840 ;
5476              15850             HD      7,MESSAG,E,DLINE-8
5476  87                                    DEFB    7+80H
5477  4D                                    DEFM    'MESSAG'
5478  45
5479  53
547A  53
547B  41
547C  47
547D  C5                                    DEFB    'E'+80H
547E  6454                                  DEFW    DLINE-8
                                            ENDM
5480              15860 MESS        DW8     DOCOL,WARN,AT,ZBRAN,MESS1-$,DDUP,ZBRAN,MESS2
-$
5480  2448                                  DEFW    DOCOL
5482  4549                                  DEFW    WARN
5484  AA47                                  DEFW    AT
5486  C643                                  DEFW    ZBRAN
5488  1E00                                  DEFW    MESS1-$
548A  E34A                                  DEFW    DDUP
548C  C643                                  DEFW    ZBRAN
548E  1400                                  DEFW    MESS2-$
                                            ENDM
5490              15870             DW8     LIT,4,OFSET,AT,BSCR,SLASH,SUBB,DLINE
5490  8D43                                  DEFW    LIT
5492  0400                                  DEFW    4
5494  9649                                  DEFW    OFSET
5496  AA47                                  DEFW    AT
5498  FD48                                  DEFW    BSCR
549A  E453                                  DEFW    SLASH
549C  5A4A                                  DEFW    SUBB
549E  6C54                                  DEFW    DLINE
                                            ENDM
54A0              15880             DW      SPACE
54A0  D44A                                  DEFW    SPACE
                                            ENDM
54A2              15890 MESS2       DW2     BRAN,MESS3-$
54A2  AF43                                  DEFW    BRAN
54A4  0D00                                  DEFW    MESS3-$
                                            ENDM
54A6              15900 MESS1       DW      PDOTQ
54A6  6E4D                                  DEFW    PDOTQ
                                            ENDM
54A8              15910             DB      6
54A8  06                                    DEFB    6
```

```
                                  ENDM
54A9 4D          15920            DEFM      'MSG # '
54AA 53
54AB 47
54AC 20
54AD 23
54AE 20
54AF             15930            DW        DOT
54AF F059                         DEFW      DOT
                                  ENDM
54B1             15940 MESS3      DW        SEMIS
54B1 5B46                         DEFW      SEMIS
                                  ENDM
                 15950 ;
54B3             15960            HD        2,P,@,MESS-0AH
54B3 82                           DEFB      2+80H
54B4 50                           DEFM      'P'
54B5 C0                           DEFB      '@'+80H
54B6 7654                         DEFW      MESS-0AH
                                  ENDM
54B8             15970 PTAT       DW        $+2
54B8 BA54                         DEFW      $+2
                                  ENDM
54BA D1          15980            POP       DE
54BB 51          15990            LD        D,C
54BC 4B          16000            LD        C,E
54BD ED78        16010            IN        A,(C)
54BF 4A          16020            LD        C,D
54C0 6F          16030            LD        L,A
54C1 2600        16040            LD        H,0
54C3 C37B43      16050            JP        HPUSH
                 16060 ;
54C6             16070            HD        2,P,!,PTAT-5
54C6 82                           DEFB      2+80H
54C7 50                           DEFM      'P'
54C8 A1                           DEFB      '!'+80H
54C9 B354                         DEFW      PTAT-5
                                  ENDM
54CB             16080 PTSTO      DW        $+2
54CB CD54                         DEFW      $+2
                                  ENDM
54CD D1          16090            POP       DE
54CE 51          16100            LD        D,C
54CF 4B          16110            LD        C,E
54D0 E1          16120            POP       HL
54D1 7D          16130            LD        A,L
54D2 ED79        16140            OUT       (C),A
54D4 4A          16150            LD        C,D
54D5 C37C43      16160            JP        NEXT
                 16170 ;
                 16180 ; ESF WORDS
                 16190 ;
3012             16200 ESFSEL     EQU       3012H
300F             16210 ESFPSN     EQU       300FH
3003             16220 ESFREA     EQU       3003H
3006             16230 ESFWRI     EQU       3006H
3021             16240 ESFMRK     EQU       3021H
3000             16250 ESFREW     EQU       3000H
```

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                      16260 ;
54D8                  16270         HD      6,REWIN,D,PTSTO-5
54D8 86                             DEFB    6+80H
54D9 52                             DEFM    ' REWIN'
54DA 45
54DB 57
54DC 49
54DD 4E
54DE C4                             DEFB    ' D' +80H
54DF C654                           DEFW    PTSTO-5
                                    ENDM
54E1                  16280 REWIND  DW      $+2
54E1 E354                           DEFW    $+2
                                    ENDM
54E3 C5               16290         PUSH    BC
54E4 D5               16300         PUSH    DE
54E5 CD0030           16310         CALL    ESFREW
54E8 187D             16320         JR      ESFRTN
                      16330 ;
54EA                  16340         HD      6,SELEC,T,REWIND-9
54EA 86                             DEFB    6+80H
54EB 53                             DEFM    ' SELEC'
54EC 45
54ED 4C
54EE 45
54EF 43
54F0 D4                             DEFB    ' T' +80H
54F1 D854                           DEFW    REWIND-9
                                    ENDM
54F3                  16350 SELEC   DW      $+2
54F3 F554                           DEFW    $+2
                                    ENDM
54F5 E1               16360         POP     HL
54F6 C5               16370         PUSH    BC
54F7 D5               16380         PUSH    DE
54F8 7D               16390         LD      A,L
54F9 FE00             16400         CP      0
54FB FA6755           16410         JP      M,ESFRTN
54FE FE08             16420         CP      8
5500 F26755           16430         JP      P,ESFRTN
5503 CD1230           16440         CALL    ESFSEL
5506 185F             16450         JR      ESFRTN
                      16460 ;
5508                  16470         HD      4,POS,N,SELEC-9
5508 84                             DEFB    4+80H
5509 50                             DEFM    ' POS'
550A 4F
550B 53
550C CE                             DEFB    ' N' +80H
550D EA54                           DEFW    SELEC-9
                                    ENDM
550F                  16480 POSN    DW      $+2
550F 1155                           DEFW    $+2
                                    ENDM
5511 E1               16490         POP     HL
5512 7D               16500         LD      A,L
5513 C5               16510         PUSH    BC
5514 D5               16520         PUSH    DE
```

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5515 FE00    16530        CP      0
5517 2004    16540        JR      NZ,ESFP1
5519 3E01    16550        LD      A,1
551B 184A    16560        JR      ESFRTN
551D CD0F30  16570 ESFP1  CALL    ESFPSN
5520 1845    16580        JR      ESFRTN
             16590 ;
5522         16600        HD      10,BLOCK-REA,D,POSN-7
5522 8A                   DEFB    10+80H
5523 42                   DEFM    'BLOCK-REA'
5524 4C
5525 4F
5526 43
5527 4B
5528 2D
5529 52
552A 45
552B 41
552C C4                  DEFB    'D'+80H
552D 0855                DEFW    POSN-7
                         ENDM
552F         16610 BREAD  DW      $+2
552F 3155                DEFW    $+2
                         ENDM
5531 E1      16620        POP     HL
5532 C5      16630        PUSH    BC
5533 D5      16640        PUSH    DE
5534 010004  16650        LD      BC,400H
5537 CD0330  16660        CALL    ESFREA
553A 182B    16670        JR      ESFRTN
             16680 ;
553C         16690        HD      11,BLOCK-WRIT,E,BREAD-13
553C 8B                   DEFB    11+80H
553D 42                   DEFM    'BLOCK-WRIT'
553E 4C
553F 4F
5540 43
5541 4B
5542 2D
5543 57
5544 52
5545 49
5546 54
5547 C5                  DEFB    'E'+80H
5548 2255                DEFW    BREAD-13
                         ENDM
554A         16700 BWRITE DW      $+2
554A 4C55                DEFW    $+2
                         ENDM
554C E1      16710        POP     HL
554D C5      16720        PUSH    BC
554E D5      16730        PUSH    DE
554F 010004  16740        LD      BC,400H
5552 CD0630  16750        CALL    ESFWRI
5555 1810    16760        JR      ESFRTN
             16770 ;
5557         16780        HD      4,MAR,K,BWRITE-14
5557 84                   DEFB    4+80H
```

```
5558 4D                        DEFM    ' MAR'
5559 41
555A 52
555B CB                        DEFB    'K'+80H
555C 3C55                      DEFW    BWRITE-14
                               ENDM
555E          16790 MARK       DW      $+2
555E 6055                      DEFW    $+2
                               ENDM
5560 E1       16800            POP     HL
5561 7D       16810            LD      A,L
5562 C5       16820            PUSH    BC
5563 D5       16830            PUSH    DE
5564 CD2130   16840            CALL    ESFMRK
              16850 ;
5567          16860 ESFRTN     EQU     $
5567 D1       16870            POP     DE
5568 C1       16880            POP     BC
5569 6F       16890            LD      L,A
556A 2600     16900            LD      H,0
556C CB4F     16910            BIT     1,A
556E 2809     16920            JR      Z,ESFEND
5570 D5       16930            PUSH    DE
5571 FDE5     16940            PUSH    IY
5573 CD2B00   16950            CALL    KYBD
5576 FDE1     16960            POP     IY
5578 D1       16970            POP     DE
5579 C37B43   16980 ESFEND     JP      HPUSH
              16990 ;
              17000 ; VARIABLES & CONSTANTS FOR PERIPHERAL I/O
              17010 ;
557C          17020            HD      3,US,E,MARK-7
557C 83                        DEFB    3+80H
557D 55                        DEFM    'US'
557E 53
557F C5                        DEFB    'E'+80H
5580 5755                      DEFW    MARK-7
                               ENDM
5582          17030 USE        DW2     DOVAR,BUF1
5582 8048                      DEFW    DOVAR
5584 E473                      DEFW    BUF1
                               ENDM
              17040 ;
5586          17050            HD      4,PRE,V,USE-6
5586 84                        DEFB    4+80H
5587 50                        DEFM    'PRE'
5588 52
5589 45
558A D6                        DEFB    'V'+80H
558B 7C55                      DEFW    USE-6
                               ENDM
558D          17060 PREV       DW2     DOVAR,BUF1
558D 8048                      DEFW    DOVAR
558F E473                      DEFW    BUF1
                               ENDM
              17070 ;
5591          17080            HD      5,#BUF,F,PREV-7
5591 85                        DEFB    5+80H
```

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5592 23                      DEFM    '#BUF'
5593 42
5594 55
5595 46
5596 C6                      DEFB    'F' +80H
5597 8655                    DEFW    PREV-7
                             ENDM
5599         17090 NOBUF     DW2     DOCON,NBUF
5599 6648                    DEFW    DOCON
559B 0300                    DEFW    NBUF
                             ENDM
             17100 ;
559D         17110           HD      4,+BU,F,NOBUF-8
559D 84                      DEFB    4+80H
559E 2B                      DEFM    '+BU'
559F 42
55A0 55
55A1 C6                      DEFB    'F' +80H
55A2 9155                    DEFW    NOBUF-8
                             ENDM
55A4         17120 PBUF      DW8     DOCOL,LIT,C0,PLUS,DUP,LIMIT,EQUAL.ZBRAN
55A4 2448                    DEFW    DOCOL
55A6 8D43                    DEFW    LIT
55A8 0404                    DEFW    C0
55AA DC46                    DEFW    PLUS
55AC 6947                    DEFW    DUP
55AE E548                    DEFW    LIMIT
55B0 684A                    DEFW    EQUAL
55B2 C643                    DEFW    ZBRAN
                             ENDM
55B4         17130           DW3     PBUF1-$,DROP,FIRST
55B4 0600                    DEFW    PBUF1-$
55B6 4F47                    DEFW    DROP
55B8 D948                    DEFW    FIRST
                             ENDM
55BA         17140 PBUF1     DW5     DUP,PREV,AT,SUBB,SEMIS
55BA 6947                    DEFW    DUP
55BC 8D55                    DEFW    PREV
55BE AA47                    DEFW    AT
55C0 5A4A                    DEFW    SUBB
55C2 5B46                    DEFW    SEMIS
                             ENDM
             17150 ;
55C4         17160           HD      6,UPDAT,E,PBUF-7
55C4 86                      DEFB    6+80H
55C5 55                      DEFM    'UPDAT'
55C6 50
55C7 44
55C8 41
55C9 54
55CA C5                      DEFB    'E' +80H
55CB 9D55                    DEFW    PBUF-7
                             ENDM
55CD         17170 UPDAT     DW8     DOCOL,PREV,AT,AT,LIT,8000H,ORR.PREV
55CD 2448                    DEFW    DOCOL
55CF 8D55                    DEFW    PREV
55D1 AA47                    DEFW    AT
55D3 AA47                    DEFW    AT
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55D5 8D43                    DEFW    LIT
55D7 0080                    DEFW    8000H
55D9 E945                    DEFW    ORR
55DB 8D55                    DEFW    PREV
                             ENDM
55DD          17180          DW3     AT,STORE,SEMIS
55DD AA47                    DEFW    AT
55DF E147                    DEFW    STORE
55E1 5B46                    DEFW    SEMIS
                             ENDM
              17190 ;
55E3          17200          HD      0DH,EMPTY-BUFFER,S,UPDAT-9
55E3 8D                      DEFB    0DH+80H
55E4 45                      DEFM    'EMPTY-BUFFER'
55E5 4D
55E6 50
55E7 54
55E8 59
55E9 2D
55EA 42
55EB 55
55EC 46
55ED 46
55EE 45
55EF 52
55F0 D3                      DEFB    'S'+80H
55F1 C455                    DEFW    UPDAT-9
                             ENDM
55F3          17210 MTBUF    DW7     DOCOL,FIRST,LIMIT,OVER,SUBB.ERASEE.SEMIS
55F3 2448                    DEFW    DOCOL
55F5 D948                    DEFW    FIRST
55F7 E548                    DEFW    LIMIT
55F9 4047                    DEFW    OVER
55FB 5A4A                    DEFW    SUBB
55FD AB4E                    DEFW    ERASEE
55FF 5B46                    DEFW    SEMIS
                             ENDM
              17220 ;
5601          17230          HD      3,DR.0,MTBUF-10H
5601 83                      DEFB    3+80H
5602 44                      DEFM    'DR'
5603 52
5604 B0                      DEFB    '0'+80H
5605 E355                    DEFW    MTBUF-10H
                             ENDM
5607          17240 DRZER    DW5     DOCOL,ZERO,OFSET,STORE,SEMIS
5607 2448                    DEFW    DOCOL
5609 A248                    DEFW    ZERO
560B 9649                    DEFW    OFSET
560D E147                    DEFW    STORE
560F 5B46                    DEFW    SEMIS
                             ENDM
              17250 ;
5611          17260          HD      6,BUFFE,R,DRZER-6
5611 86                      DEFB    6+80H
5612 42                      DEFM    'BUFFE'
5613 55
5614 46
```

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5615  46
5616  45
5617  D2                        DEFB     'R' +80H
5618  0156                      DEFW     DRZER-6
                                ENDM
561A          17270 BUFFE       DW5      DOCOL,USE,AT,DUP,TOR
561A  2448                      DEFW     DOCOL
561C  8255                      DEFW     USE
561E  AA47                      DEFW     AT
5620  6947                      DEFW     DUP
5622  8646                      DEFW     TOR
                                ENDM
5624          17280 BUFF1       DW8      PBUF,ZBRAN,BUFF1-$,USE,STORE,RR,AT,ZLESS
5624  A455                      DEFW     PBUF
5626  C643                      DEFW     ZBRAN
5628  FCFF                      DEFW     BUFF1-$
562A  8255                      DEFW     USE
562C  E147                      DEFW     STORE
562E  B046                      DEFW     RR
5630  AA47                      DEFW     AT
5632  CA46                      DEFW     ZLESS
                                ENDM
5634          17290             DW8      ZBRAN,BUFF2-$,RR,TWOP,RR,AT,LIT,7FFFH
5634  C643                      DEFW     ZBRAN
5636  1400                      DEFW     BUFF2-$
5638  B046                      DEFW     RR
563A  074A                      DEFW     TWOP
563C  B046                      DEFW     RR
563E  AA47                      DEFW     AT
5640  8D43                      DEFW     LIT
5642  FF7F                      DEFW     7FFFH
                                ENDM
5644          17300             DW3      ANDD,ZERO,RSLW
5644  D745                      DEFW     ANDD
5646  A248                      DEFW     ZERO
5648  C056                      DEFW     RSLW
                                ENDM
564A          17310 BUFF2       DW8      RR,STORE,RR,PREV,STORE,FROMR,TWOP,SEMIS
564A  B046                      DEFW     RR
564C  E147                      DEFW     STORE
564E  B046                      DEFW     RR
5650  8D55                      DEFW     PREV
5652  E147                      DEFW     STORE
5654  9C46                      DEFW     FROMR
5656  074A                      DEFW     TWOP
5658  5B46                      DEFW     SEMIS
                                ENDM
              17320 ;
565A          17330             HD       5,BLOC,K,BUFFE-9
565A  85                        DEFB     5+80H
565B  42                        DEFM     'BLOC'
565C  4C
565D  4F
565E  43
565F  CB                        DEFB     'K' +80H
5660  1156                      DEFW     BUFFE-9
                                ENDM
5662          17340 BLOCK       DW8      DOCOL,OFSET,AT,PLUS,TOR,PREV,AT,DUP
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```
5662 2448                   DEFW    DOCOL
5664 9649                   DEFW    OFSET
5666 AA47                   DEFW    AT
5668 DC46                   DEFW    PLUS
566A 8646                   DEFW    TOR
566C 8D55                   DEFW    PREV
566E AA47                   DEFW    AT
5670 6947                   DEFW    DUP
                            ENDM
5672         17350      DW7    AT,RR,SUBB,DUP,PLUS,ZBRAN,BLOC1-$
5672 AA47                   DEFW    AT
5674 B046                   DEFW    RR
5676 5A4A                   DEFW    SUBB
5678 6947                   DEFW    DUP
567A DC46                   DEFW    PLUS
567C C643                   DEFW    ZBRAN
567E 3400                   DEFW    BLOC1-$
                            ENDM
5680         17360 BLOC2  DW8    PBUF,ZEQU,ZBRAN,BLOC3-$,DROP.RR.BUFFE.DUP
5680 A455                   DEFW    PBUF
5682 B746                   DEFW    ZEQU
5684 C643                   DEFW    ZBRAN
5686 1400                   DEFW    BLOC3-$
5688 4F47                   DEFW    DROP
568A B046                   DEFW    RR
568C 1A56                   DEFW    BUFFE
568E 6947                   DEFW    DUP
                            ENDM
5690         17370      DW5    RR,ONE,RSLW,TWO,SUBB
5690 B046                   DEFW    RR
5692 AA48                   DEFW    ONE
5694 C056                   DEFW    RSLW
5696 B248                   DEFW    TWO
5698 5A4A                   DEFW    SUBB
                            ENDM
569A         17380 BLOC3  DW8    DUP,AT,RR,SUBB,DUP,PLUS,ZEQU,ZBRAN
569A 6947                   DEFW    DUP
569C AA47                   DEFW    AT
569E B046                   DEFW    RR
56A0 5A4A                   DEFW    SUBB
56A2 6947                   DEFW    DUP
56A4 DC46                   DEFW    PLUS
56A6 B746                   DEFW    ZEQU
56A8 C643                   DEFW    ZBRAN
                            ENDM
56AA         17390      DW4    BLOC2-$,DUP,PREV,STORE
56AA D6FF                   DEFW    BLOC2-$
56AC 6947                   DEFW    DUP
56AE 8D55                   DEFW    PREV
56B0 E147                   DEFW    STORE
                            ENDM
56B2         17400 BLOC1  DW4    FROMR,DROP,TWOP,SEMIS
56B2 9C46                   DEFW    FROMR
56B4 4F47                   DEFW    DROP
56B6 074A                   DEFW    TWOP
56B8 5B46                   DEFW    SEMIS
                            ENDM
             17410 ;
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56BA              17420      HD      3,R/,W,BLOCK-8
56BA 83                      DEFB    3+80H
56BB 52                      DEFM    'R/'
56BC 2F
56BD D7                      DEFB    'W'+80H
56BE 5A56                    DEFW    BLOCK-8
                             ENDM
56C0              17430 RSLW DW8     DOCOL,SWAP,POSN,LIT,10,QERR,ZBRAN.RSLW1-$
56C0 2448                    DEFW    DOCOL
56C2 5C47                    DEFW    SWAP
56C4 0F55                    DEFW    POSN
56C6 8D43                    DEFW    LIT
56C8 0A00                    DEFW    10
56CA 8B4B                    DEFW    QERR
56CC C643                    DEFW    ZBRAN
56CE 0E00                    DEFW    RSLW1-$
                             ENDM
56D0              17440      DW6     BREAD,LIT,11,QERR,BRAN,RSLW2-$
56D0 2F55                    DEFW    BREAD
56D2 8D43                    DEFW    LIT
56D4 0B00                    DEFW    11
56D6 8B4B                    DEFW    QERR
56D8 AF43                    DEFW    BRAN
56DA 0A00                    DEFW    RSLW2-$
                             ENDM
56DC              17450 RSLW1 DW4    BWRITE,LIT,12,QERR
56DC 4A55                    DEFW    BWRITE
56DE 8D43                    DEFW    LIT
56E0 0C00                    DEFW    12
56E2 8B4B                    DEFW    QERR
                             ENDM
56E4              17460 RSLW2 DW     SEMIS
56E4 5B46                    DEFW    SEMIS
                             ENDM
                  17470 ;
56E6              17480      HD      5,FLUS,H,RSLW-6
56E6 85                      DEFB    5+80H
56E7 46                      DEFM    'FLUS'
56E8 4C
56E9 55
56EA 53
56EB C8                      DEFB    'H'+80H
56EC BA56                    DEFW    RSLW-6
                             ENDM
56EE              17490 FLUSH DW5    DOCOL,NOBUF,ONEP,ZERO,XDO
56EE 2448                    DEFW    DOCOL
56F0 9955                    DEFW    NOBUF
56F2 FA49                    DEFW    ONEP
56F4 A248                    DEFW    ZERO
56F6 1F44                    DEFW    XDO
                             ENDM
56F8              17500 FLUS1 DW6    ZERO,BUFFE,DROP,XLOOP,FLUS1-$.SEMIS
56F8 A248                    DEFW    ZERO
56FA 1A56                    DEFW    BUFFE
56FC 4F47                    DEFW    DROP
56FE DA43                    DEFW    XLOOP
5700 F8FF                    DEFW    FLUS1-$
5702 5B46                    DEFW    SEMIS
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                                ENDM
                     17510  ;
5704                 17520          HD        4,LOA,D,FLUSH-8
5704 84                             DEFB      4+80H
5705 4C                             DEFM      'LOA'
5706 4F
5707 41
5708 C4                             DEFB      'D'+80H
5709 E656                           DEFW      FLUSH-8
                                    ENDM
570B                 17530 LOAD     DW8       DOCOL,BLK,AT,TOR,INN,AT,TOR.ZERO
570B 2448                           DEFW      DOCOL
570D 7049                           DEFW      BLK
570F AA47                           DEFW      AT
5711 8646                           DEFW      TOR
5713 7849                           DEFW      INN
5715 AA47                           DEFW      AT
5717 8646                           DEFW      TOR
5719 A248                           DEFW      ZERO
                                    ENDM
571B                 17540          DW8       INN,STORE,BSCR,STAR,BLK,STORE,INTER.FROMR
571B 7849                           DEFW      INN
571D E147                           DEFW      STORE
571F FD48                           DEFW      BSCR
5721 C553                           DEFW      STAR
5723 7049                           DEFW      BLK
5725 E147                           DEFW      STORE
5727 6C51                           DEFW      INTER
5729 9C46                           DEFW      FROMR
                                    ENDM
572B                 17550          DW6       INN,STORE,FROMR,BLK,STORE,SEMIS
572B 7849                           DEFW      INN
572D E147                           DEFW      STORE
572F 9C46                           DEFW      FROMR
5731 7049                           DEFW      BLK
5733 E147                           DEFW      STORE
5735 5B46                           DEFW      SEMIS
                                    ENDM
                     17560  ;
5737                 17570          HD        43H,--,>,LOAD-7
5737 C3                             DEFB      43H+80H
5738 2D                             DEFM      '--'
5739 2D
573A BE                             DEFB      '>'+80H
573B 0457                           DEFW      LOAD-7
                                    ENDM
573D                 17580 ARROW    DW8       DOCOL,QLOAD,ZERO,INN,STORE.BSCR.BLK,AT
573D 2448                           DEFW      DOCOL
573F 044C                           DEFW      QLOAD
5741 A248                           DEFW      ZERO
5743 7849                           DEFW      INN
5745 E147                           DEFW      STORE
5747 FD48                           DEFW      BSCR
5749 7049                           DEFW      BLK
574B AA47                           DEFW      AT
                                    ENDM
574D                 17590          DW6       OVER,MODD,SUBB,BLK,PSTOR,SEMIS
574D 4047                           DEFW      OVER
```

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574F F453                      DEFW    MODD
5751 5A4A                      DEFW    SUBB
5753 7049                      DEFW    BLK
5755 8547                      DEFW    PSTOR
5757 5B46                      DEFW    SEMIS
                               ENDM
                 17600 ;
                 17610 ; TRS-80 I/O ROUTINES
                 17620 ;
0033             17630 DSPLY   EQU     033H
002B             17640 KYBD    EQU     02BH
                 17650 ;
5759             17660 PEMIT   DW      $+2
5759 5B57                      DEFW    $+2
                               ENDM
575B E1          17670         POP     HL
575C 7D          17680         LD      A,L
575D E67F        17690         AND     7FH
575F D5          17700         PUSH    DE
5760 FDE5        17710         PUSH    IY
5762 CD3300      17720         CALL    DSPLY
5765 FDE1        17730         POP     IY
5767 D1          17740         POP     DE
5768 C37C43      17750         JP      NEXT
                 17760 ;
576B D5          17770 PKEY    PUSH    DE
576C FDE5        17780         PUSH    IY
576E CD2B00      17790 PKEY1   CALL    KYBD
5771 B7          17800         OR      A
5772 28FA        17810         JR      Z,PKEY1
5774 1806        17820         JR      PQ010
                 17830 ;
5776 D5          17840 PQTER   PUSH    DE
5777 FDE5        17850         PUSH    IY
5779 CD2B00      17860         CALL    KYBD
577C FDE1        17870 PQ010   POP     IY
577E D1          17880         POP     DE
577F FE0A        17890         CP      0AH      ; CHECK FOR RBRAC
5781 2002        17900         JR      NZ,PQ020
5783 3E5D        17910         LD      A,5DH
5785 6F          17920 PQ020   LD      L,A
5786 2600        17930         LD      H,0
5788 C37B43      17940         JP      HPUSH
                 17950 ;
578B 210D00      17960 PCR     LD      HL,ACR
578E E5          17970         PUSH    HL
578F 18CA        17980         JR      PEMIT+2
                 17990 ;
5791             18000         DB      0C1H
5791 C1                        DEFB    0C1H
                               ENDM
5792             18010         DB      0A7H
5792 A7                        DEFB    0A7H
                               ENDM
5793             18020         DW      ARROW-6
5793 3757                      DEFW    ARROW-6
                               ENDM
5795             18030 TICK    DW8     DOCOL,DFIND,ZEQU,ZERO,QERR,DROP,LITER,SEMIS
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```
5795 2448                       DEFW    DOCOL
5797 EA4F                       DEFW    DFIND
5799 B746                       DEFW    ZEQU
579B A248                       DEFW    ZERO
579D 8B4B                       DEFW    QERR
579F 4F47                       DEFW    DROP
57A1 0451                       DEFW    LITER
57A3 5B46                       DEFW    SEMIS
                                ENDM
                  18040 ;
57A5              18050  HD      6,FORGE,T,TICK-4
57A5 86                         DEFB    6+80H
57A6 46                         DEFM    'FORGE'
57A7 4F
57A8 52
57A9 47
57AA 45
57AB D4                         DEFB    'T'+80H
57AC 9157                       DEFW    TICK-4
                                ENDM
57AE              18060 FORG    DW8     DOCOL,CURR,AT,CONT,AT,SUBB.LIT.18H
57AE 2448                       DEFW    DOCOL
57B0 B049                       DEFW    CURR
57B2 AA47                       DEFW    AT
57B4 A349                       DEFW    CONT
57B6 AA47                       DEFW    AT
57B8 5A4A                       DEFW    SUBB
57BA 8D43                       DEFW    LIT
57BC 1800                       DEFW    18H
                                ENDM
57BE              18070  DW8     QERR,TICK,DUP,FENCE,AT,LESS,LIT,15H
57BE 8B4B                       DEFW    QERR
57C0 9557                       DEFW    TICK
57C2 6947                       DEFW    DUP
57C4 5049                       DEFW    FENCE
57C6 AA47                       DEFW    AT
57C8 744A                       DEFW    LESS
57CA 8D43                       DEFW    LIT
57CC 1500                       DEFW    15H
                                ENDM
57CE ·            18080  DW8     QERR,DUP,NFA,DP,STORE,LFA,AT,CONT
57CE 8B4B                       DEFW    QERR
57D0 6947                       DEFW    DUP
57D2 4D4B                       DEFW    NFA
57D4 5849                       DEFW    DP
57D6 E147                       DEFW    STORE
57D8 2F4B                       DEFW    LFA
57DA AA47                       DEFW    AT
57DC A349                       DEFW    CONT
                                ENDM
57DE              18090  DW3     AT,STORE,SEMIS
57DE AA47                       DEFW    AT
57E0 E147                       DEFW    STORE
57E2 5B46                       DEFW    SEMIS
                                ENDM
                  18100 ;
57E4              18110  HD      4,BAC,K,FORG-9
57E4 84                         DEFB    4+80H
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57E5 42                     DEFM      ' BAC'
57E6 41
57E7 43
57E8 CB                     DEFB      'K' +80H
57E9 A557                   DEFW      FORG-9
                            ENDM
57EB            18120 BACK  DW5       DOCOL,HERE,SUBB,COMMA,SEMIS
57EB 2448                   DEFW      DOCOL
57ED 164A                   DEFW      HERE
57EF 5A4A                   DEFW      SUBB
57F1 324A                   DEFW      COMMA
57F3 5B46                   DEFW      SEMIS
                            ENDM
               18130 ;
57F5           18140        HD        45H,BEGI,N,BACK-7
57F5 C5                     DEFB      45H+80H
57F6 42                     DEFM      ' BEGI'
57F7 45
57F8 47
57F9 49
57FA CE                     DEFB      'N' +80H
57FB E457                   DEFW      BACK-7
                            ENDM
57FD           18150 BEGIN  DW5       DOCOL,QCOMP,HERE,ONE,SEMIS
57FD 2448                   DEFW      DOCOL
57FF A54B                   DEFW      QCOMP
5801 164A                   DEFW      HERE
5803 AA48                   DEFW      ONE
5805 5B46                   DEFW      SEMIS
                            ENDM
               18160 ;
5807           18170        HD        45H,ENDI,F,BEGIN-8
5807 C5                     DEFB      45H+80H
5808 45                     DEFM      ' ENDI'
5809 4E
580A 44
580B 49
580C C6                     DEFB      'F' +80H
580D F557                   DEFW      BEGIN-8
                            ENDM
580F           18180 ENDIFF DW8       DOCOL,QCOMP,TWO,QPAIR,HERE,OVER,SUBB,SWAP
580F 2448                   DEFW      DOCOL
5811 A54B                   DEFW      QCOMP
5813 B248                   DEFW      TWO
5815 D44B                   DEFW      QPAIR
5817 164A                   DEFW      HERE
5819 4047                   DEFW      OVER
581B 5A4A                   DEFW      SUBB
581D 5C47                   DEFW      SWAP
                            ENDM
581F           18190        DW2       STORE,SEMIS
581F E147                   DEFW      STORE
5821 5B46                   DEFW      SEMIS
                            ENDM
               18200 ;
5823           18210        HD        44H,THE,N,ENDIFF-8
5823 C4                     DEFB      44H+80H
5824 54                     DEFM      ' THE'
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5825 48
5826 45
5827 CE                             DEFB     'N' +80H
5828 0758                           DEFW     ENDIFF-8
                                    ENDM
582A            18220 THEN          DW3      DOCOL,ENDIFF,SEMIS
582A 2448                           DEFW     DOCOL
582C 0F58                           DEFW     ENDIFF
582E 5B46                           DEFW     SEMIS
                                    ENDM
                18230 ;
5830            18240               HD       42H,D,O,THEN-7
5830 C2                             DEFB     42H+80H
5831 44                             DEFM     'D'
5832 CF                             DEFB     'O' +80H
5833 2358                           DEFW     THEN-7
                                    ENDM
5835            18250 DO            DW6      DOCOL,COMP,XDO,HERE,THREE,SEMIS
5835 2448                           DEFW     DOCOL
5837 1E4C                           DEFW     COMP
5839 1F44                           DEFW     XDO
583B 164A                           DEFW     HERE
583D BA48                           DEFW     THREE
583F 5B46                           DEFW     SEMIS
                                    ENDM
                18260 ;
5841            18270               HD       44H,LOO,P,DO-5
5841 C4                             DEFB     44H+80H
5842 4C                             DEFM     'LOO'
5843 4F
5844 4F
5845 D0                             DEFB     'P' +80H
5846 3058                           DEFW     DO-5
                                    ENDM
5848            18280 LOOP          DW7      DOCOL,THREE,QPAIR,COMP,XLOOP.BACK.SEMIS
5848 2448                           DEFW     DOCOL
584A BA48                           DEFW     THREE
584C D44B                           DEFW     QPAIR
584E 1E4C                           DEFW     COMP
5850 DA43                           DEFW     XLOOP
5852 EB57                           DEFW     BACK
5854 5B46                           DEFW     SEMIS
                                    ENDM
                18290 ;
5856            18300               HD       45H,+LOO,P,LOOP-7
5856 C5                             DEFB     45H+80H
5857 2B                             DEFM     ' +LOO'
5858 4C
5859 4F
585A 4F
585B D0                             DEFB     'P' +80H
585C 4158                           DEFW     LOOP-7
                                    ENDM
585E            18310 PLOOP         DW7      DOCOL,THREE,QPAIR,COMP,XPLOO.BACK,SEMIS
585E 2448                           DEFW     DOCOL
5860 BA48                           DEFW     THREE
5862 D44B                           DEFW     QPAIR
5864 1E4C                           DEFW     COMP
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5866 1344                      DEFW    XPLOO
5868 EB57                      DEFW    BACK
586A 5B46                      DEFW    SEMIS
                               ENDM
              18320 ;
586C          18330      HD     45H,UNTI,L,PLOOP-8
586C C5                        DEFB    45H+80H
586D 55                        DEFM    'UNTI'
586E 4E
586F 54
5870 49
5871 CC                        DEFB    'L'+80H
5872 5658                      DEFW    PLOOP-8
                               ENDM
5874          18340 UNTIL    DW7     DOCOL,ONE,QPAIR,COMP,ZBRAN,BACK,SEMIS
5874 2448                      DEFW    DOCOL
5876 AA48                      DEFW    ONE
5878 D44B                      DEFW    QPAIR
587A 1E4C                      DEFW    COMP
587C C643                      DEFW    ZBRAN
587E EB57                      DEFW    BACK
5880 5B46                      DEFW    SEMIS
                               ENDM
              18350 ;
5882          18360      HD     43H,EN,D,UNTIL-8
5882 C3                        DEFB    43H+80H
5883 45                        DEFM    'EN'
5884 4E
5885 C4                        DEFB    'D'+80H
5886 6C58                      DEFW    UNTIL-8
                               ENDM
5888          18370 ENDD     DW3     DOCOL,UNTIL,SEMIS
5888 2448                      DEFW    DOCOL
588A 7458                      DEFW    UNTIL
588C 5B46                      DEFW    SEMIS
                               ENDM
              18380 ;
588E          18390      HD     45H,AGAI,N,ENDD-6
588E C5                        DEFB    45H+80H
588F 41                        DEFM    'AGAI'
5890 47
5891 41
5892 49
5893 CE                        DEFB    'N'+80H
5894 8258                      DEFW    ENDD-6
                               ENDM
5896          18400 AGAIN    DW7     DOCOL,ONE,QPAIR,COMP,BRAN,BACK,SEMIS
5896 2448                      DEFW    DOCOL
5898 AA48                      DEFW    ONE
589A D44B                      DEFW    QPAIR
589C 1E4C                      DEFW    COMP
589E AF43                      DEFW    BRAN
58A0 EB57                      DEFW    BACK
58A2 5B46                      DEFW    SEMIS
                               ENDM
              18410 ;
58A4          18420      HD     46H,REPEA,T,AGAIN-8
58A4 C6                        DEFB    46H+80H
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58A5 52                       DEFM    ' REPEA'
58A6 45
58A7 50
58A8 45
58A9 41
58AA D4                       DEFB    ' T' +80H
58AB 8E58                      DEFW    AGAIN-8
                              ENDM
58AD          18430 REPEA     DW8     DOCOL,TOR,TOR,AGAIN,FROMR,FROMR.TWO.SUBB
58AD 2448                     DEFW    DOCOL
58AF 8646                     DEFW    TOR
58B1 8646                     DEFW    TOR
58B3 9658                     DEFW    AGAIN
58B5 9C46                     DEFW    FROMR
58B7 ·9C46                    DEFW    FROMR
58B9 B248                     DEFW    TWO
58BB 5A4A                     DEFW    SUBB
                              ENDM
58BD          18440           DW2     ENDIFF,SEMIS
58BD 0F58                     DEFW    ENDIFF
58BF 5B46                     DEFW    SEMIS
                              ENDM
              18450 ;
58C1          18460           HD      42H,I,F,REPEA-9
58C1 C2                       DEFB    42H+80H
58C2 49                       DEFM    ' I'
58C3 C6                       DEFB    ' F' +80H
58C4 A458                     DEFW    REPEA-9
                              ENDM
58C6          18470 IFF       DW8     DOCOL.COMP,ZBRAN,HERE,ZERO,COMMA.TWO.SEMIS
58C6 2448                     DEFW    DOCOL
58C8 1E4C                     DEFW    COMP
58CA C643                     DEFW    ZBRAN
58CC 164A                     DEFW    HERE
58CE A248                     DEFW    ZERO
58D0 324A                     DEFW    COMMA
58D2 B248                     DEFW    TWO
58D4 5B46                     DEFW    SEMIS
                              ENDM
              18480 ;
58D6          18490           HD      44H,ELS,E,IFF-5
58D6 C4                       DEFB    44H+80H
58D7 45                       DEFM    ' ELS'
58D8 4C
58D9 53
58DA C5                       DEFB    ' E' +80H
58DB C158                     DEFW    IFF-5
                              ENDM
58DD          18500 ELSEE     DW8     DOCOL,TWO,QPAIR,COMP,BRAN,HERE,ZERO.COMMA
58DD 2448                     DEFW    DOCOL
58DF B248                     DEFW    TWO
58E1 D44B                     DEFW    QPAIR
58E3 1E4C                     DEFW    COMP
58E5 AF43                     DEFW    BRAN
58E7 164A                     DEFW    HERE
58E9 A248                     DEFW    ZERO
58EB 324A                     DEFW    COMMA
                              ENDM
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58ED                18510              DW5      SWAP,TWO,ENDIFF,TWO,SEMIS
58ED 5C47                              DEFW     SWAP
58EF B248                              DEFW     TWO
58F1 0F58                              DEFW     ENDIFF
58F3 B248                              DEFW     TWO
58F5 5B46                              DEFW     SEMIS
                                       ENDM
                    18520 ;
58F7                18530              HD       45H,WHIL,E,ELSEE-7
58F7 C5                                DEFB     45H+80H
58F8 57                                DEFM     'WHIL'
58F9 48
58FA 49
58FB 4C
58FC C5                                DEFB     'E'+80H
58FD D658                              DEFW     ELSEE-7
                                       ENDM
58FF                18540 WHILE        DW4      DOCOL,IFF,TWOP,SEMIS
58FF 2448                              DEFW     DOCOL
5901 C658                              DEFW     IFF
5903 074A                              DEFW     TWOP
5905 5B46                              DEFW     SEMIS
                                       ENDM
                    18550 ;
5907                18560              HD       6,SPACE,S,WHILE-8
5907 86                                DEFB     6+80H
5908 53                                DEFM     'SPACE'
5909 50
590A 41
590B 43
590C 45
590D D3                                DEFB     'S'+80H
590E F758                              DEFW     WHILE-8
                                       ENDM
5910                18570 SPACS        DW8      DOCOL,ZERO,MAX,DDUP,ZBRAN,SPAX1-$,ZERO,XDO
5910 2448                              DEFW     DOCOL
5912 A248                              DEFW     ZERO
5914 6F53                              DEFW     MAX
5916 E34A                              DEFW     DDUP
5918 C643                              DEFW     ZBRAN
591A 0C00                              DEFW     SPAX1-$
591C A248                              DEFW     ZERO
591E 1F44                              DEFW     XDO
                                       ENDM
5920                18580 SPAX2        DW3      SPACE,XLOOP,SPAX2-$
5920 D44A                              DEFW     SPACE
5922 DA43                              DEFW     XLOOP
5924 FCFF                              DEFW     SPAX2-$
                                       ENDM
5926                18590 SPAX1        DW       SEMIS
5926 5B46                              DEFW     SEMIS
                                       ENDM
                    18600 ;
5928                18610              HD       2,<,*,SPACS-9
5928 82                                DEFB     2+80H
5929 3C                                DEFM     '<'
592A A3                                DEFB     '*'+80H
592B 0759                              DEFW     SPACS-9
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                              ENDM
592D            18620 BDIGS   DW5      DOCOL,PAD,HLD,STORE,SEMIS
592D 2448                     DEFW     DOCOL
592F E34E                     DEFW     PAD
5931 F149                     DEFW     HLD
5933 E147                     DEFW     STORE
5935 5B46                     DEFW     SEMIS
                              ENDM
                18630 ;
5937            18640         HD       2,#,>,BDIGS-5
5937 82                       DEFB     2+80H
5938 23                       DEFM     '#'
5939 BE                       DEFB     '>'+80H
593A 2859                     DEFW     BDIGS-5
                              ENDM
593C            18650 EDIGS   DW8      DOCOL,DROP,DROP,HLD,AT,PAD,OVER,SUBB
593C 2448                     DEFW     DOCOL
593E 4F47                     DEFW     DROP
5940 4F47                     DEFW     DROP
5942 F149                     DEFW     HLD
5944 AA47                     DEFW     AT
5946 E34E                     DEFW     PAD
5948 4047                     DEFW     OVER
594A 5A4A                     DEFW     SUBB
                              ENDM
594C            18660         DW       SEMIS
594C 5B46                     DEFW     SEMIS
                              ENDM
                18670 ;
594E            18680         HD       4,SIG,N,EDIGS-5
594E 84                       DEFB     4+80H
594F 53                       DEFM     'SIG'
5950 49
5951 47
5952 CE                       DEFB     'N'+80H
5953 3759                     DEFW     EDIGS-5
                              ENDM
5955            18690 SIGN    DW8      DOCOL,ROT,ZLESS,ZBRAN,SIGN1-$,LIT,02DH,HOLD
5955 2448                     DEFW     DOCOL
5957 C44A                     DEFW     ROT
5959 CA46                     DEFW     ZLESS
595B C643                     DEFW     ZBRAN
595D 0800                     DEFW     SIGN1-$
595F 8D43                     DEFW     LIT
5961 2D00                     DEFW     02DH
5963 CB4E                     DEFW     HOLD
                              ENDM
5965            18700 SIGN1   DW       SEMIS
5965 5B46                     DEFW     SEMIS
                              ENDM
                18710 ;
5967            18720         DB       81H
5967 81                       DEFB     81H
                              ENDM
5968            18730         MB       #
5968 A3                       DEFB     '#'+80H
                              ENDM
5969            18740         DW       SIGN-7
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5969  4E59                        DEFW    SIGN-7
                                  ENDM
596B              18750 DIG       DW8     DOCOL,BASE,AT.MSMOD,ROT,LIT,9,OVER
596B  2448                        DEFW    DOCOL
596D  C549                        DEFW    BASE
596F  AA47                        DEFW    AT
5971  2754                        DEFW    MSMOD
5973  C44A                        DEFW    ROT
5975  8D43                        DEFW    LIT
5977  0900                        DEFW    9
5979  4047                        DEFW    OVER
                                  ENDM
597B              18760           DW6     LESS,ZBRAN,DIG1-$,LIT,7,PLUS
597B  744A                        DEFW    LESS
597D  C643                        DEFW    ZBRAN
597F  0800                        DEFW    DIG1-$
5981  8D43                        DEFW    LIT
5983  0700                        DEFW    7
5985  DC46                        DEFW    PLUS
                                  ENDM
5987              18770 DIG1      DW5     LIT,30H,PLUS,HOLD,SEMIS
5987  8D43                        DEFW    LIT
5989  3000                        DEFW    30H
598B  DC46                        DEFW    PLUS
598D  CB4E                        DEFW    HOLD
598F  5B46                        DEFW    SEMIS
                                  ENDM
                  18780 ;
5991              18790           HD      2,#,S,DIG-4
5991  82                          DEFB    2+80H
5992  23                          DEFM    '#'
5993  D3                          DEFB    'S'+80H
5994  6759                        DEFW    DIG-4
                                  ENDM
5996              18800 DIGS      DW      DOCOL
5996  2448                        DEFW    DOCOL
                                  ENDM
5998              18810 DIGS1     DW8     DIG,OVER,OVER,ORR,ZEQU,ZBRAN.DIGS1-$.SEMIS
5998  6B59                        DEFW    DIG
599A  4047                        DEFW    OVER
599C  4047                        DEFW    OVER
599E  E945                        DEFW    ORR
59A0  B746                        DEFW    ZEQU
59A2  C643                        DEFW    ZBRAN
59A4  F4FF                        DEFW    DIGS1-$
59A6  5B46                        DEFW    SEMIS
                                  ENDM
                  18820 ;
59A8              18830           HD      3,D.,R,DIGS-5
59A8  83                          DEFB    3+80H
59A9  44                          DEFM    'D.'
59AA  2E
59AB  D2                          DEFB    'R'+80H
59AC  9159                        DEFW    DIGS-5
                                  ENDM
59AE              18840 DDOTR     DW8     DOCOL,TOR,SWAP,OVER,DABS,BDIGS.DIGS.SIGN
59AE  2448                        DEFW    DOCOL
59B0  8646                        DEFW    TOR
```

```
59B2  5C47                    DEFW      SWAP
59B4  4047                    DEFW      OVER
59B6  4B53                    DEFW      DABS
59B8  2D59                    DEFW      BDIGS
59BA  9659                    DEFW      DIGS
59BC  5559                    DEFW      SIGN
                              ENDM
59BE            18850         DW7       EDIGS,FROMR,OVER,SUBB,SPACS,TYPE,SEMIS
59BE  3C59                    DEFW      EDIGS
59C0  9C46                    DEFW      FROMR
59C2  4047                    DEFW      OVER
59C4  5A4A                    DEFW      SUBB
59C6  1059                    DEFW      SPACS
59C8  0D4D                    DEFW      TYPE
59CA  5B46                    DEFW      SEMIS
                              ENDM
                18860  ;
59CC            18870         HD        2,.,R,DDOTR-6
59CC  82                      DEFB      2+80H
59CD  2E                      DEFM      '.'
59CE  D2                      DEFB      'R'+80H
59CF  A859                    DEFW      DDOTR-6
                              ENDM
59D1            18880  DOTR   DW6       DOCOL,TOR,STOD,FROMR,DDOTR,SEMIS
59D1  2448                    DEFW      DOCOL
59D3  8646                    DEFW      TOR
59D5  0453                    DEFW      STOD
59D7  9C46                    DEFW      FROMR
59D9  AE59                    DEFW      DDOTR
59DB  5B46                    DEFW      SEMIS
                              ENDM
                18890  ;
59DD            18900         HD        2,D,.,DOTR-5
59DD  82                      DEFB      2+80H
59DE  44                      DEFM      'D'
59DF  AE                      DEFB      '.'+80H
59E0  CC59                    DEFW      DOTR-5
                              ENDM
59E2            18910  DDOT   DW5       DOCOL,ZERO,DDOTR,SPACE,SEMIS
59E2  2448                    DEFW      DOCOL
59E4  A248                    DEFW      ZERO
59E6  AE59                    DEFW      DDOTR
59E8  D44A                    DEFW      SPACE
59EA  5B46                    DEFW      SEMIS
                              ENDM
                18920  ;
59EC            18930         DB        81H
59EC  81                      DEFB      81H
                              ENDM
59ED            18940         MB        .
59ED  AE                      DEFB      '.'+80H
                              ENDM
59EE            18950         DW        DDOT-5
59EE  DD59                    DEFW      DDOT-5
                              ENDM
59F0            18960  DOT    DW4       DOCOL,STOD,DDOT,SEMIS
59F0  2448                    DEFW      DOCOL
59F2  0453                    DEFW      STOD
```

```
59F4 E259                    DEFW    DDOT
59F6 5B46                    DEFW    SEMIS
                             ENDM
             18970 ;
59F8         18980           DB      81H
59F8 81                      DEFB    81H
                             ENDM
59F9         18990           MB      ?
59F9 BF                      DEFB    '?'+80H
                             ENDM
59FA         19000           DW      DOT-4
59FA EC59                    DEFW    DOT-4
                             ENDM
59FC         19010 QUES      DW4     DOCOL,AT,DOT,SEMIS
59FC 2448                    DEFW    DOCOL
59FE AA47                    DEFW    AT
5A00 F059                    DEFW    DOT
5A02 5B46                    DEFW    SEMIS
                             ENDM
             19020 ;
5A04         19030           HD      2,U,.,QUES-4
5A04 82                      DEFB    2+80H
5A05 55                      DEFM    'U'
5A06 AE                      DEFB    '.'+80H
5A07 F859                    DEFW    QUES-4
                             ENDM
5A09         19040 UDOT      DW4     DOCOL,ZERO,DDOT,SEMIS
5A09 2448                    DEFW    DOCOL
5A0B A248                    DEFW    ZERO
5A0D E259                    DEFW    DDOT
5A0F 5B46                    DEFW    SEMIS
                             ENDM
             19050 ;
5A11         19060           HD      5,VLIS,T,UDOT-5
5A11 85                      DEFB    5+80H
5A12 56                      DEFM    'VLIS'
5A13 4C
5A14 49
5A15 53
5A16 D4                      DEFB    'T'+80H
5A17 045A                    DEFW    UDOT-5
                             ENDM
5A19         19070 VLIST     DW8     DOCOL,LIT,80H,OUTT,STORE,CONT,AT,AT
5A19 2448                    DEFW    DOCOL
5A1B 8D43                    DEFW    LIT
5A1D 8000                    DEFW    80H
5A1F 8149                    DEFW    OUTT
5A21 E147                    DEFW    STORE
5A23 A349                    DEFW    CONT
5A25 AA47                    DEFW    AT
5A27 AA47                    DEFW    AT
                             ENDM
5A29         19080 VLIS1     DW8     OUTT,AT,CSLL,GREAT,ZBRAN,VLIS2-$,CR,ZERO
5A29 8149                    DEFW    OUTT
5A2B AA47                    DEFW    AT
5A2D CD48                    DEFW    CSLL
5A2F B64A                    DEFW    GREAT
5A31 C643                    DEFW    ZBRAN
```

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5A33  0A00              DEFW    VLIS2-$
5A35  3745              DEFW    CR
5A37  A248              DEFW    ZERO
                        ENDM
5A39          19090     DW2     OUTT,STORE
5A39  8149              DEFW    OUTT
5A3B  E147              DEFW    STORE
                        ENDM
5A3D          19100 VLIS2   DW8   DUP,IDDOT,SPACE,SPACE,PFA,LFA,AT,DUP
5A3D  6947              DEFW    DUP
5A3F  5950              DEFW    IDDOT
5A41  D44A              DEFW    SPACE
5A43  D44A              DEFW    SPACE
5A45  634B              DEFW    PFA
5A47  2F4B              DEFW    LFA
5A49  AA47              DEFW    AT
5A4B  6947              DEFW    DUP
                        ENDM
5A4D          19110     DW7     ZEQU,QTERM,ORR,ZBRAN,VLIS1-$,DROP,SEMIS
5A4D  B746              DEFW    ZEQU
5A4F  2A45              DEFW    QTERM
5A51  E945              DEFW    ORR
5A53  C643              DEFW    ZBRAN
5A55  D4FF              DEFW    VLIS1-$
5A57  4F47              DEFW    DROP
5A59  5B46              DEFW    SEMIS
                        ENDM
              19120 ;
5A5B          19130     HD      3,BY,E,VLIST-8
5A5B  83                DEFB    3+80H
5A5C  42                DEFM    ' BY'
5A5D  59
5A5E  C5                DEFB    ' E' +80H
5A5F  115A              DEFW    VLIST-8
                        ENDM
5A61          19140 BYE     DW      $+2
5A61  635A              DEFW    $+2
                        ENDM
5A63  C37200  19150     JP      72H       ; WARM RTN TO LEV II
              19160 ;
5A66          19170     HD      4,LIS,T,BYE-6
5A66  84                DEFB    4+80H
5A67  4C                DEFM    'LIS'
5A68  49
5A69  53
5A6A  D4                DEFB    ' T' +80H
5A6B  5B5A              DEFW    BYE-6
                        ENDM
5A6D          19180 LIST    DW7     DOCOL,DEC,CR,DUP,SCR,STORE,PDOTQ
5A6D  2448              DEFW    DOCOL
5A6F  7F4C              DEFW    DEC
5A71  3745              DEFW    CR
5A73  6947              DEFW    DUP
5A75  8A49              DEFW    SCR
5A77  E147              DEFW    STORE
5A79  6E4D              DEFW    PDOTQ
                        ENDM
5A7B          19190     DB      6
```

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5A7B  06                      DEFB    6
                              ENDM
5A7C  53        19200         DEFM    'SCR # '
5A7D  43
5A7E  52
5A7F  20
5A80  23
5A81  20
5A82            19210         DW5     DOT,LIT,10H,ZERO,XDO
5A82  F059                    DEFW    DOT
5A84  8D43                    DEFW    LIT
5A86  1000                    DEFW    10H
5A88  A248                    DEFW    ZERO
5A8A  1F44                    DEFW    XDO
                              ENDM
5A8C            19220 LIST1   DW8     CR,IDO,LIT,3,DOTR,SPACE,IDO,SCR
5A8C  3745                    DEFW    CR
5A8E  3B44                    DEFW    IDO
5A90  8D43                    DEFW    LIT
5A92  0300                    DEFW    3
5A94  D159                    DEFW    DOTR
5A96  D44A                    DEFW    SPACE
5A98  3B44                    DEFW    IDO
5A9A  8A49                    DEFW    SCR
                              ENDM
5A9C            19230         DW6     AT,DLINE,QTERM,ZBRAN,LIST2-$,LEAVE
5A9C  AA47                    DEFW    AT
5A9E  6C54                    DEFW    DLINE
5AA0  2A45                    DEFW    QTERM
5AA2  C643                    DEFW    ZBRAN
5AA4  0400                    DEFW    LIST2-$
5AA6  7246                    DEFW    LEAVE
                              ENDM
5AA8            19240 LIST2   DW4     XLOOP,LIST1-$,CR,SEMIS
5AA8  DA43                    DEFW    XLOOP
5AAA  E2FF                    DEFW    LIST1-$
5AAC  3745                    DEFW    CR
5AAE  5B46                    DEFW    SEMIS
                              ENDM
                19250 ;
5AB0            19260         HD      S,INDE,X,LIST-7
5AB0  85                      DEFB    S+80H
5AB1  49                      DEFM    'INDE'
5AB2  4E
5AB3  44
5AB4  45
5AB5  D8                      DEFB    'X'+80H
5AB6  665A                    DEFW    LIST-7
                              ENDM
5AB8            19270 INDEX   DW8     DOCOL,LIT,FF,EMIT,CR,ONEP,SWAP.XDO
5AB8  2448                    DEFW    DOCOL
5ABA  8D43                    DEFW    LIT
5ABC  0C00                    DEFW    FF
5ABE  0745                    DEFW    EMIT
5AC0  3745                    DEFW    CR
5AC2  FA49                    DEFW    ONEP
5AC4  5C47                    DEFW    SWAP
5AC6  1F44                    DEFW    XDO
```

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                              ENDM
5AC8              19280 INDE1  DW8      CR,IDO,LIT,3,DOTR,SPACE,ZERO.IDO
5AC8  3745                     DEFW     CR
5ACA  3B44                     DEFW     IDO
5ACC  8D43                     DEFW     LIT
5ACE  0300                     DEFW     3
5AD0  D159                     DEFW     DOTR
5AD2  D44A                     DEFW     SPACE
5AD4  A248                     DEFW     ZERO
5AD6  3B44                     DEFW     IDO
                              ENDM
5AD8              19290        DW5      DLINE,QTERM,ZBRAN,INDE2-$,LEAVE
5AD8  6C54                     DEFW     DLINE
5ADA  2A45                     DEFW     QTERM
5ADC  C643                     DEFW     ZBRAN
5ADE  0400                     DEFW     INDE2-$
5AE0  7246                     DEFW     LEAVE
                              ENDM
5AE2              19300 INDE2  DW3      XLOOP,INDE1-$,SEMIS
5AE2  DA43                     DEFW     XLOOP
5AE4  E4FF                     DEFW     INDE1-$
5AE6  5B46                     DEFW     SEMIS
                              ENDM
                  19310 ;
5AE8              19320        HD       5,TRIA,D,INDEX-8
5AE8  85                       DEFB     5+80H
5AE9  54                       DEFM     'TRIA'
5AEA  52
5AEB  49
5AEC  41
5AED  C4                       DEFB     'D'+80H
5AEE  B05A                     DEFW     INDEX-8
                              ENDM
5AF0              19330 TRIAD  DW8      DOCOL,LIT,FF,EMIT,LIT,3,SLASH.LIT
5AF0  2448                     DEFW     DOCOL
5AF2  8D43                     DEFW     LIT
5AF4  0C00                     DEFW     FF
5AF6  0745                     DEFW     EMIT
5AF8  8D43                     DEFW     LIT
5AFA  0300                     DEFW     3
5AFC  E453                     DEFW     SLASH
5AFE  8D43                     DEFW     LIT
                              ENDM
5B00              19340        DW8      3,STAR,LIT,3,OVER.PLUS,SWAP,XDO
5B00  0300                     DEFW     3
5B02  C553                     DEFW     STAR
5B04  8D43                     DEFW     LIT
5B06  0300                     DEFW     3
5B08  4047                     DEFW     OVER
5B0A  DC46                     DEFW     PLUS
5B0C  5C47                     DEFW     SWAP
5B0E  1F44                     DEFW     XDO
                              ENDM
5B10              19350 TRIA1  DW7      CR,IDO,LIST,QTERM,ZBRAN,TRIA2-$,LEAVE
5B10  3745                     DEFW     CR
5B12  3B44                     DEFW     IDO
5B14  6D5A                     DEFW     LIST
5B16  2A45                     DEFW     QTERM
```

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5B18  C643                    DEFW      ZBRAN
5B1A  0400                    DEFW      TRIA2-$
5B1C  7246                    DEFW      LEAVE
                             ENDM
5B1E           19360 TRIA2   DW8       XLOOP,TRIA1-$,CR.LIT,15,MESS.CR,SEMIS
5B1E  DA43                    DEFW      XLOOP
5B20  F0FF                    DEFW      TRIA1-$
5B22  3745                    DEFW      CR
5B24  8D43                    DEFW      LIT
5B26  0F00                    DEFW      15
5B28  8054                    DEFW      MESS
5B2A  3745                    DEFW      CR
5B2C  5B46                    DEFW      SEMIS
                             ENDM
               19370 ;
5B2E           19380         HD        4,.CP,U,TRIAD-8
5B2E  84                      DEFB      4+80H
5B2F  2E                      DEFM      '.CP'
5B30  43
5B31  50
5B32  D5                      DEFB      'U'+80H
5B33  E25A                    DEFW      TRIAD-8
                             ENDM
5B35           19390 DOTCPU  DW8       DOCOL,BASE,AT,LIT,36,BASE,STORE,LIT
5B35  2448                    DEFW      DOCOL
5B37  C549                    DEFW      BASE
5B39  AA47                    DEFW      AT
5B3B  8D43                    DEFW      LIT
5B3D  2400                    DEFW      36
5B3F  C549                    DEFW      BASE
5B41  E147                    DEFW      STORE
5B43  8D43                    DEFW      LIT
                             ENDM
5B45           19400         DW7       22H,PORIG,TAT,DDOT,BASE,STORE,SEMIS
5B45  2200                    DEFW      22H
5B47  0B49                    DEFW      PORIG
5B49  C747                    DEFW      TAT
5B4B  E259                    DEFW      DDOT
5B4D  C549                    DEFW      BASE
5B4F  E147                    DEFW      STORE
5B51  5B46                    DEFW      SEMIS
                             ENDM
               19410 ;
5B53           19420         HD        4,TAS,K,DOTCPU-7
5B53  84                      DEFB      4+80H
5B54  54                      DEFM      'TAS'
5B55  41
5B56  53
5B57  CB                      DEFB      'K'+80H
5B58  2E5B                    DEFW      DOTCPU-7
                             ENDM
5B5A           19430 TASK    DW2       DOCOL,SEMIS
5B5A  2448                    DEFW      DOCOL
5B5C  5B46                    DEFW      SEMIS
                             ENDM
               19440 ;
5B5E           19450 INITDP: DEFS      EM-$              ; CONSUME MEM TO LIMIT
4350           19460         END       ORIG
```

```
00000 TOTAL ERRORS

ABL      0020
ABORT    5269
ABS      533C
ACR      000D
ADOT     002E
AGAIN    5896
ALLOT    4A26
ANDD     45D7
ARROW    573D
AT       47AA
BACK     57EB
BASE     49C5
BBUF     48F1
BCOMP    50E8
BDIGS    592D
BEGIN    57FD
BELL     0007
BL       48C3
BLANK    4EBC
BLK      4970
BLOC1    56B2
BLOC2    5680
BLOC3    569A
PLOCK    5662
BRAN     43AF
BRAN1    43B1
BREAD    552F
BSCR     48FD
ESCRE    0001
BSIN     0008
BSOUT    0008
BUF1     73E4
BUFF1    5624
BUFF2    564A
BUFFE    561A
BUILD    4CC3
BWRITE   554A
BYE      5A61
C0       0404
CAT      47B9
CCOMM    4A43
CFA      4B3F
CLD      52A5
CLD1     52BA
CMOVE    4544
COLD     52C3
COLON    4810
COMMA    4A32
COMP     4C1E
CON      485C
CONT     49A3
COUNT    4CFA
CR       4537
CREA1    50A6
CREAT    5090
CSLL     48CD
```

```
CSPP      49E0
CSTOR     47F0
CURR      49B0
DABS      534B
DB              M
DDOT      59E2
DDOTR     59AE
DDUP      4AE3
DDUP1     4AED
DEC       4C7F
DEFIN     521B
DFIN1     500A
DFIND     4FEA
DIG       596B
DIG1      5987
DIGI1     4465
DIGI2     4470
DIGIT     444F
DIGS      5996
DIGS1     5998
DLE       0010
DLINE     546C
DLIT1     5131
DLITE     5121
DM              M
DMINU     4722
DO        5835
DOCOL     4824
DOCON     4866
DODOE     4CDF
DOES      4CD3
DOT   ·   59F0
DOTCPU    5B35
DOTQ      4D87
DOTQ1     4DA7
DOTQ2     4DAF
DOTR      59D1
DOUSE     4892
DOVAC     51F3
DOVAR     4880
DP        4958
DP0 ·     4387
DPL       49CE
DPLUS     46E9
DPM       532A
DPM1      5334
DPUSH     437A
DROP      474F
DRZER     5607
DSPLY     0033
DTRA1     4D43
DTRA2     4D5D
DTRA3     4D61
DTRAI     4D3B
DUP       4769
DW              M
DW2             M
DW3             M
```

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DW4                 M
DW5                 M
DW6                 M
DW7                 M
DW8                 M
EDIGS     593C
ELSEE     58DD
EM        7FF0
EMIT      4507
ENCL      44C7
ENCL1     44D1
ENCL2     44E7
ENCL3     44F1
ENCL4     44F8
ENDD      5888
ENDIFF    580F
EQUAL     4A68
ERASEE    4EAB
ERRO1     5032
ERRO2     5051
ERROR     5024
ESFEND    5579
ESFMRK    3021
ESFP1     551D
ESFPSN    300F
ESFREA    3003
ESFREW    3000
ESFRTN    5567
ESFSEL    3012
ESFWRI    3006
EXEC      43A1
EXPE1     4DC4
EXPE2     4DFE
EXPE3     4E24
EXPE4     4E16
EXPE5     4E18
EXPE6     4DF6
EXPE7     4DFA
EXPEC     4DBA
FENCE     4950
FF        000C
FILL      4E8D
FILL1     4E95
FILL2     4E9F
FIRST     48D9
FLD       49D7
FLUS1     56F8
FLUSH     56EE
FORG      57AE
FORTH     5203
FROMR     469C
GREAT     4AB6
HD                  M
HERE      4A16
HEX       4C69
HLD       49F1
HOLD      4ECB
HPUSH     437B
```

```
IDDOT   5059
IDO     443B
IFF     58C6
IMMED   51BA
INDE1   5AC8
INDE2   5AE2
INDEX   5AB8
INITDP  5B5E
INITR0  73A4
INITS0  7304
INN     4978
INTE1   516E
INTE2   5190
INTE3   5186
INTE4   518A
INTE5   51AA
INTE6   51A4
INTE7   51A8
INTER   516C
KBBUF   0400
KEY     4519
KYBD    002B
LATES   4B1F
LBRAC   4C34
LEAVE   4672
LES1    4A80
LES2    4A8B
LESS    4A74
LF      000A
LFA     4B2F
LIMIT   48E5
LIST    5A6D
LIST1   5A8C
LIST2   5AA8
LIT     438D
LITE1   5114
LITER   5104
LOAD    570B
LOOP    5848
MARK    555E
MAX     536F
MAX1    537B
MB               M
MESS    5480
MESS1   54A6
MESS2   54A2
MESS3   54B1
MIN     5359
MIN1    5365
MINUS   470C
MODD    53F4
MPYX    4574
MPYX1   4579
MPYX2   4581
MSLAS   539F
MSMOD   5427
MSTAR   5384
MTBUF   55F3
```

```
NBUF     0003
NEXT     437C
NEXT1    4382
NFA      4B4D
NOBUF    5599
NOOP     484D
NSCR     0003
NULL     4E4E
NULL1    4E80
NULL2    4E7C
NULL3    4E84
NUMB     4F92
NUMB1    4FB0
NUMB2    4FD6
NUMB3    4FE0
OFSET    4996
ONE      48AA
ONEP     49FA
ORIG     4350
ORR      45E9
OUTT     4981
OVER     4740
PABOR    5016
PAD      4EE3
PAREN    522B
PBUF     55A4
PBUF1    55DA
PCR      578B
PDOTQ    4D6E
PEMIT    5759
PFA      4B63
PFIN1    4480
PFIN2    4488
PFIN3    44A5
PFIN4    44A7
PFIN5    44AD
PFIN6    4496
PFIND    447D
PKEY     576B
PKEY1    576E
PLINE    5446
PLOOP    585E
PLUS     46DC
PM       5318
PM1      5322
PNUM1    4F49
PNUM2    4F85
PNUM3    4F7F
PNUMB    4F47
PORIG    490B
POSN     550F
PQ010    577C
PQ020    5785
PQTER    5776
PREV     558D
PSCOD    4C95
PSTOR    4785
PTAT     54B8
```

```
PTSTO    54CB
QCOMP    4BA5
QCSP     4BE7
QERR     4B8B
QERR1    4B99
QERR2    4B9B
QEXEC    4BBD
QLOAD    4C04
QPAIR    4BD4
QSTAC    513C
QTERM    452A
QUERY    4E36
QUES     59FC
QUIT     523C
QUIT1    5246
QUIT2    525D
RBRAC    4C42
RELEAS   0001
REPEA    58AD
REVISI   0000
REWIND   54E1
RNUM     49E8
ROT      4AC4
RPAT     4635
RPP      4378
RPSTO    4643
RR       46B0
RSLW     56C0
RSLW1    56DC
RSLW2    56E4
RTS      00A0
RZERO    4923
SCR      498A
SCSP     4B78
SELEC    54F3
SEMI     4838
SEMI1    4CB5
SEMIC    4CAB
SEMIS    465B
SIGN     5955
SIGN1    5965
SLASH    53E4
SLMOD    53D4
SMUDG    4C57
SPACE    4AD4
SPACS    5910
SPAT     460F
SPAX1    5926
SPAX2    592D
SPSTO    461E
SSLA     5415
SSMOD    5404
SSUB     4A4F
STAR     53C5
STATE    49BB
STOD     5304
STOD1    5310
STORE    47E1
```

```
SUBB     4A5A
SWAP     475C
SZERO    491A
TASK     5B5A
TAT      47C7
TDUP     4777
THEN     582A
THREE    48BA
TIB      492D
TICK     5795
TOGGL    479C
TOR      4686
TRAV     4AFA
TRAV1    4AFE
TRIA1    5B10
TRIA2    5B1E
TRIAD    5AF0
TSTOR    47FD
TWO      48B2
TWOP     4A07
TYPE     4D0D
TYPE1    4D2B
TYPE2    4D1D
TYPE3    4D2D
UDOT     5A09
ULES1    4AAC
ULES2    4AB0
ULESS    4A96
UNTIL    5874
UP       4376
UPDAT    55CD
US       0040
USE      5582
USER     488C
USLA1    45A5
USLA2    45A7
USLA3    45AF
USLA4    45BC
USLA5    45C6
USLA6    45C7
USLA7    45CB
USLAS    458A
USRVER   0000
USTAR    4556
VAR      487A
VLIS1    5A29
VLIS2    5A3D
VLIST    5A19
VOCAB    51D3
VOCL     4966
WARM     529F
WARN     4945
WHILE    58FF
WIDTH    4938
WORD     4EF6
WORD1    4F0A
WORD2    4F0E
WRM      528B
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